PICTURED KNOWLEDGE

"IN THE PAGES OF GOOD BOOKS
LIES THE MAGIC TO INSPIRE OUR
DREAMS AND THE POWER TO MAKE
THOSE DREAMS COME TRUE"

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PICTURED KNOWLEDGE

THE NEW METHOD OF
VISUAL INSTRUCTION APPLIED TO
ALL SCHOOL SUBJECTS

Dedicated to Our Boys and Girls

VOL. V

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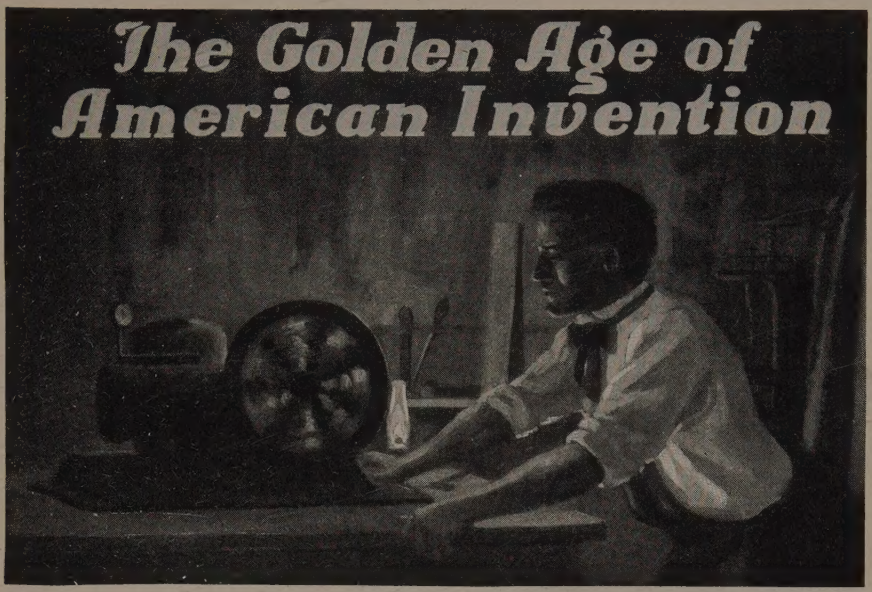
The Golden Age of American Invention



IT is the most wonderful experience, as one grows older and reads more history, to discover that there are long periods of time when little progress is made in any field; and other periods when the stage is filled with remarkable men, and events of immense consequence follow each other in rapid succession.

Such stirring times of great men and shining deeds, that create new heritages for the race, are called "Ages." The Age of Pericles in Greece reached the pinnacle of Art. The Augustan Age of Rome brought government to its highest point of power and glory. The Elizabethan Age was one of inspiration in English literature; and the Age of Discovery of Columbus gave us a planet for human activities. You can not read of such times without a thrill of pride and joy that men have achieved so much. But here is a curious thing: you can live in such a time without knowing it.

"Golden Age" in History

And We Live in a Golden Age

A thousand years from now historians will probably speak of ours as the Age of Invention. Chains have been struck from the hands of labor, and countless tasks given to machines. The industries and population of civilized countries have been multiplied, time and distance conquered by steam and electricity, and all the peoples of the world have become neighbors, concerned about each other's affairs and trading in each other's markets.

This age is a long one, and every western nation has had a part in it. Indeed, England calls it the Victorian Age of her history, but it began fifty years before Queen Victoria was born, and is not yet ended. And the United States has the most names on the roll of honor, and the credit of many of the greatest inventions and scientific discoveries.

Harvesting in Bible Days

Here you can see how they used to harvest wheat in Bible days. The old ways of harvesting are still used by small farmers in Egypt, and this reproduction of a painting by the famous French artist, Gerome, called "Treading out the Corn," shows how they did it. "Corn" as used in the Bible means wheat. You will notice the oxen wear blinders, but they are not muzzled. Do you remember that the Bible says: "Thou shalt not muzzle the ox that treadeth out the corn"? Poor dumb beasts, they worked hard and were not to be cheated of their wages. That some of the old Egyptian farmers at least were too stingy to let their oxen help themselves to a little wheat now and then as they were threshing, is shown by the inscription on one of the walls of a tomb along the Nile. This inscription has been freely translated,

"Hi! along! oxen! tread the corn faster,
The chaff for yourselves, the grain for your master."

Now a word about those blinders: These blinders are to keep the ox's mind on his work. Notice also the palm branches hanging from the blinders of the oxen. What do you suppose these are for? You have noticed how the cow tosses back her head to chase away flies that her tail cannot reach, haven't you? Don't you see how such a fly brush as these steady old Egyptians here are wearing, would help out?

The Bible has many references to work in the harvest field. Here are some passages. Look them up and see how interesting they are: Gen. 42:2; Acts 7:12; Deut. 24:19; 1 Cor. 9:9; 1 Tim. 5:18; Judg. 15:5; Job 5:26; Pss. 4:7, 65:9, 13; 72:16; Prov. 11:26; Zech. 9:17; Matt. 12:1; Mark 2:23; Luke 6:1; Mark 4:28; John 12:24; 1 Sam. 12:17; Job 31:40; Pss. 81:16; 147:14; Jer. 12:13; 23:28; Matt. 3:12; Luke 22:31.

In our country this age began with Benjamin Franklin, who captured electricity with a kite-string and a bottle, and made scientific experiments that won him fame in the capitals of Europe. And I think, too, that it began also in the little farm and village workshops of colonial New England, where every man and boy was obliged to mend and make his tools, and contrive conveniences of every sort. Franklin found his own sort in the groups of scientists in London, Paris and Edinburgh, who were investigating the properties of electricity and steam. And he was in England when James Watt, the instrument-maker for Glasgow University, im-

Beginnings of Our Inventive Age

proved the stationary steam engine. Hitherto this was used simply to pump water out of deep coal mines. It must long have had only this limited use but for the fact that James Hargreaves soon after invented the spinning jenny and Richard Arkwright the spinning frame. When the steam engine was set to turning the wheels of cotton and woolen mills, all the conditions of the textile industries were changed. Human hands could not compete with machines. This was a hardship at first, for it threatened to leave many hands idle.

How Eli Saw the Wheels Go Round

Have you ever heard a watch spoken of as a "turnip"? You see from the shape of this one how the word originated. But the most interesting thing about this watch is that it helped to teach Eli Whitney how to invent the cotton gin. Like other boys, he was very much interested in seeing how wheels went round, so one Sunday when the family were at church he took this big silver watch from the peg where it was hanging on the wall. Then with his pocket knife he got it all apart, which was easy enough. Then he put it together in good running order again before the family got back from church—which wasn't easy at all. But that he could do it showed his talent for mechanics and helped start him on the road to invention. He was always making convenient little things for his mother at home and when he grew to be a man, did similar things for his wife. For instance, he made for her a fine bureau with many drawers that were all locked up by locking the top one. Your father probably has a roller-top desk in his office, the drawers of which lock in the same way. He also made many ingenious toys for his children.

Up to about 1765 every sort of work in both the Old World and the New was done in much the same, slow, crude way as it had been done hundreds of years before. Wind still drove all the ships at sea; wind and water turned the wheels of saw and grist-mills, and animals hauled all the heavy loads and carried travelers by land. Manufacturing was done by hand in homes and small shops. Big sailing vessels were put together with the few tools of the smith and carpenter. Spinning wheels, looms, and the turner's and potter's wheels were worked by foot-power.

The Steam Engine and England's Monopoly

The invention of the steam engine, spinning frame, and power loom gave England a monopoly of the cloth market. In order to keep it, she guarded the secrets of the new inventions jealously. No mill-worker was allowed to emigrate, nor any model or drawing of machines to be taken out of the country. As to foreign lands, this was necessary at a time when there was no protection for patents, as there is today. But it was unjust to the English colonies in America, whose development and prosperity would have added to the wealth of the mother country. It was a bitter thing to see the cotton grown on our Southern plantations carried across the ocean, and brought back as finished goods that could be sold cheaper than the product of the clever and industrious hands of New England women. This was another injustice to add to the many which brought on the Revolutionary War.

How Steam Helped Bring the Revolution

After the war the new states felt no scruple about appropriating these new inventions. Men trained in the English mills did manage to slip

away to America. In 1790 Samuel Slater came and reconstructed from memory the entire machinery of Arkwright's cotton mills. Before 1800 we had cotton, woolen and carpet factories in operation, had opened coal and iron mines, and were making bar and sheet iron, and nails, sewing thread, pins and many other small articles by machinery.

American Invention Set Free

And now another difficulty arose. The mills used so much cotton that the fiber became scarce. The South could grow larger crops, but there was little profit in growing them so long as the tightly embedded seeds had to be separated from the soft, clinging lint by hand. A slave woman or child could not earn what it cost to keep her at that slow, tedious task. A machine was needed to gin cotton. And who was so likely to be able to make one as a "handy" Yankee?

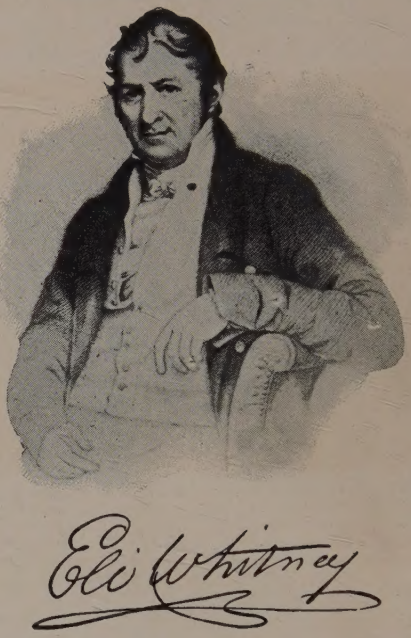
The Story of Eli Whitney

That is what Mrs. Nathaniel Greene, widow of the Revolutionary War hero, thought one morning, as she sat in the drawing room of her big plantation house on the Savannah River, Georgia. A company of wealthy planters of the neighborhood, out for a horseback ride, had stopped to lunch with her and were talking of the wealth that a cotton-ginning machine would bring to the South. Calling a servant, she sent for a guest of the house, and when a tall, grave student from New England came in, she introduced him.

"Gentlemen, this is my ingenious young Yankee friend, Mr. Whitney Explain what you require and I am sure he can help you."

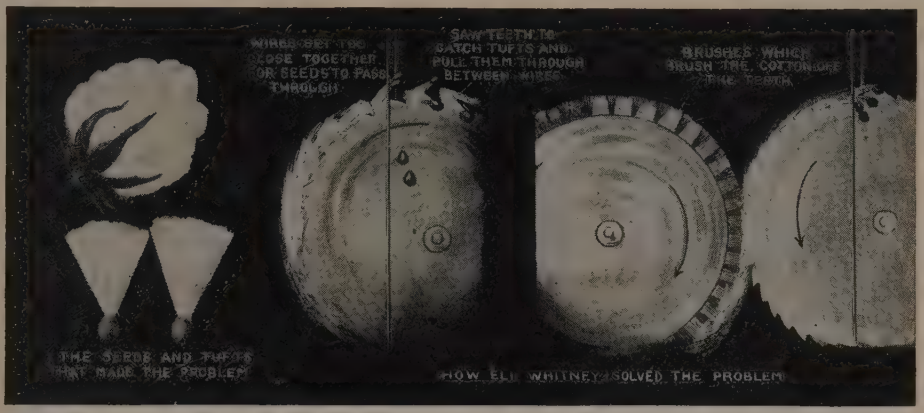
A Puritan from a bare farm among the stony hills of Massachusetts, Eli Whitney had recently been graduated from Yale College. Needing money to fit himself for the bar, he had come south to find employment as a tutor in the family of some wealthy planter. As a boy he was so clever with his hands that the farm workshop had been turned over to him. And he had earned his way through college by mending every disabled clock, gun, spinning wheel, and violin in New Haven. To repay the hospitality of the kind lady who befriended him in the South, he took charge of Mrs. Greene's plantation crafts shops and

How Eli Looked as a Man



Here is the boy who took the watch apart. But now he is a famous man and this is how he looks and how he signs his name. You see he writes a firm, strong hand and with a flourish that students of handwriting say means imagination. Like Robert Fulton, he was tall and fine looking, with hair that curled slightly and like Fulton he usually wore it hanging over his forehead. Like Fulton, also, he had very polished manners and was a social favorite. Though usually dignified and somewhat stately in his manners, he could enjoy a merry frolic with the little folks with whom he was always a great favorite.

The Cotton Seed Puzzle and How Eli Whitney Solved It


WIRES SET TOO CLOSE TOGETHER FOR SEEDS TO PASS THROUGH
SAW TEETH TO CATCH TUFTS AND PULL THEM THROUGH BETWEEN WIRES
BRUSHES WHICH BRUSH THE COTTON OFF THE TEETH
THE SEEDS AND TUFTS THAT MADE THE PROBLEM
HOW ELI WHITNEY SOLVED THE PROBLEM

This picture shows plainly the workings of Whitney's great but simple invention. On the left is the problem he had to solve—how to pull the seeds off the cotton. After thinking it over he saw that it would amount to the same thing if he pulled the cotton off the seeds. The two other pictures show how he did it. Note in the third picture how the brush-wheel and the toothed-wheel turn toward each other as explained in the description of the original Whitney model; but remember that the brush-wheel turns faster than the toothed-wheel.

made skilled workmen out of negro smiths and carpenters.

Before he was asked to invent the cotton gin he had never examined a cotton boll, but he saw at once that only fingers of some sort could do the work. Why not hundreds of little steel fingers instead of ten large human fingers? On that simple idea he worked out an ingenious machine. It was simply a big rolling-pin, fitted into a box, turned with a crank, and set with rows of steel teeth. Above the roll, and half enclosing it, was fixed a semicircular steel plate with narrow slots through which the teeth slipped as the roll was turned. Cotton dropped from a hopper above into this plate. As the roll was turned the teeth caught the lint and pulled it through the slots. The stripped seeds slid down into an outside box.

Invention of the "Iron Fingers"

This invention involved no great principles of mechanics and physics as did the steam engine, but it was, and must always be, one of the most useful and valuable of labor-saving inventions. It brought immediate wealth to the South, and raw material to build up the cotton mills of New England. So, with plantations and factories prospering, we are sorry and ashamed that his invention never brought to Mr. Whitney anything but empty honor and years of misfortune. His machine was stolen, his patents infringed, his factory burned. But his creative brain and business genius won him a competence in the manufacture of fire-arms. Like Arkwright in England, Whitney built up a model factory. He set the steam engine to driving machine tools of his own designing, brought labor under the discipline of direction and regular hours, trained ordinary mechanics into expert gunmakers, and standardized his own product. From boyhood to old age his motto was: "Whatever is worth doing, is worth doing well."

Born in 1765, he lived until 1825.

How This "Mechanical Elephant" Sucks

The first gin that Whitney invented simply took the seeds out of the cotton and left all the dead leaves and other dirt to be picked out later. After that it was baled. In the modern cotton mill like that shown in the picture, the cotton is not only freed from seeds but, to a large extent, leaves and dirt, and by a connection between the gins and the baling machine, is baled before it leaves the mill. The pipe hanging down about the center of the picture sucks up cotton as an elephant's trunk sucks up water. As soon as it is lowered on the load of cotton as it comes in the wagon from the fields, a large fan at the back end of the pipe starts to revolve, sucking the cotton up into the separator which you see attached to the pipe above the gins. You can easily identify this separator from the whole, detailed picture of it which is shown on the next page.

A similar pipe on the right-hand side of the picture is called the over-flow pipe. Sometimes when the cotton is too wet, it is sucked off the wagon faster than the gins can take care of it, so the over-flow pipe helps out the gins by carrying away part of this

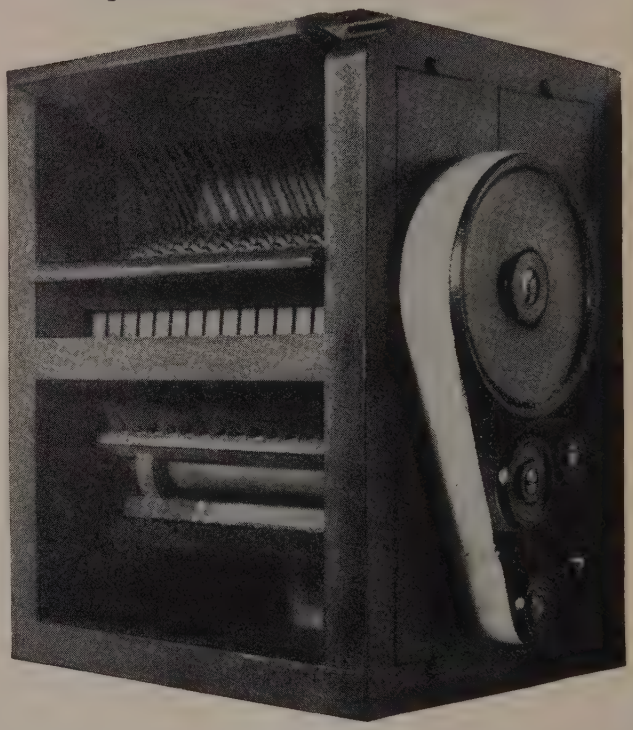
Up the Cotton and Tramps It into Bales

otton, and dropping it on the platform on the end of the row of gins. Then when the wagon has been unloaded, this surplus cotton is sucked back through the gins again.

The long trough running above the gins is called the feeder, because through it the cotton passes into the hoppers of the gins. After entering the hopper, the cotton passes into the saw teeth, the seed is separated from it, and the lint blown out through another pipe to the condenser. The condenser is the large box you see at the left side of the picture, with the two pipes sticking up from it. The condenser screens out whatever dust and dirt may still remain in the cotton. This is also where the air leaves the cotton, passing off through those pipes. But in passing off, notice how the air is still put to work. It blows the cotton against the screen on a small revolving drum. In this way the cotton is laid out in beautiful white layers before it is passed onto the press to be pressed into bales. Notice the wheel on the outside of the box. It is this wheel that turns the drum inside the box.

It was in 1807, while his fortunes were at their lowest ebb, that another American, born within a month of himself, sprang to instant fame and wealth with the invention of the steamboat.

Original Model of Eli Whitney's Cotton Gin



As you will see by the two-page picture farther on, a modern gin plant is quite a complicated affair, but the heart of it all is just the simple bit of machinery shown in Whitney's model of the cotton gin, of which this is a picture. The original is in the Smithsonian Institute in Washington. Turn your hands toward one another with the fingers spread out. Now pass the fingers of one hand between those of the other. There, you have made the most important part of the cotton gin, the part that pulls the lint from the seeds.

Just as the fingers of one hand passed between the fingers of the other, wheels in the gin with teeth in them, pass between slits in an iron bed as indicated by the wires in the upper part of the model. The slits are so small that the teeth draw the cotton through, but the seeds catch and are pulled off. In the lower part of the model is a revolving brush which brushes the cotton from the teeth of the other wheel. The belting is arranged in that peculiar way so that the wheel containing the teeth and the wheel containing the brushes turn toward each other and at the same time the brush-toothed wheel revolves much faster than the other. It is for this reason that it brushes off the cotton. If both wheels moved at the same rate, the brushes would simply pack the cotton against the teeth.

Story of "Quicksilver Bob"

The boys who lived in Lancaster, Pennsylvania, and who were ten years old when news of the battle of Lexington reached the German and Quaker village on the Susquehanna, were lucky. For a playmate they had a merry, quick-witted Irish lad who, because of some amusing experiments he had made with the liquid metal that runs up and down in the thermometer tube, had won the nickname of Quicksilver Bob.

The name exactly described Robert Fulton; such an active mind, nimble fingers, lively curiosity and astonishing ingenuity! A boy like that is liable to get into mischief, but Bob was so manly and good-tempered that he was a universal favorite; and he was so careful of the property of others that he was welcome in every craft shop in the town. Workmen loaned him their tools and the druggist gave him chemicals. He made his own rockets for the Fourth of July, and his own pencils of powdered and molded graphite. He built a windlass for the people of the town to pull heavy loads up a steep hill. He designed a gun and calculated how far it would shoot. For this he was obliged to study mathematics and physics. But the thing that excited the admiration of the other boys

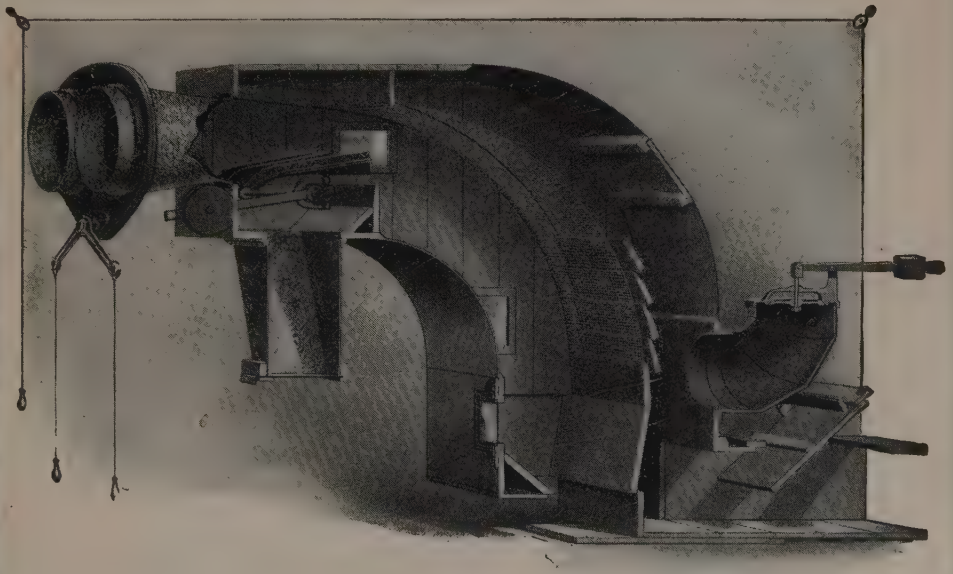
Busy Fingers and Busy Brain

The "Works" of the Feeder and the Separator

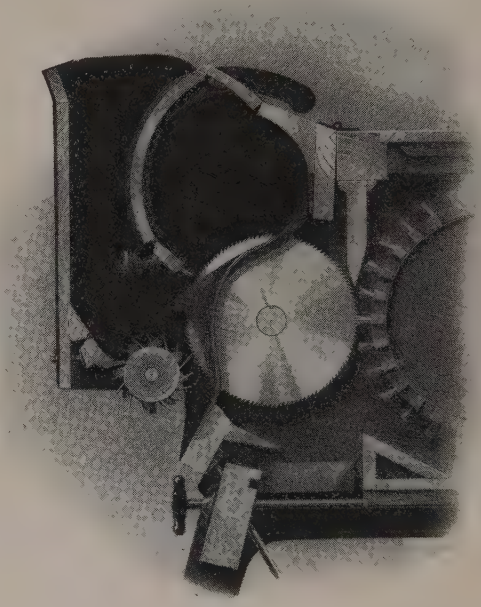
This is a view of the inside of one of the feeders, one of which is located in the top section of each gin. The two rollers turn toward each other and so pull the cotton down to the teeth of the drum. This drum revolves very fast, pulling the cotton out by bits until it is very fine. In doing this, it beats the cotton over the screen just below and screens out the dry leaves and dirt. By this same revolving of the drum, the cotton is passed on down the "slide" on the right into the gin. The "corkscrew" affair below the drum with its screen, is what is called a spiral conveyor. It catches the dirt as it falls through the screen and carries it out.

The Inside of the Separator

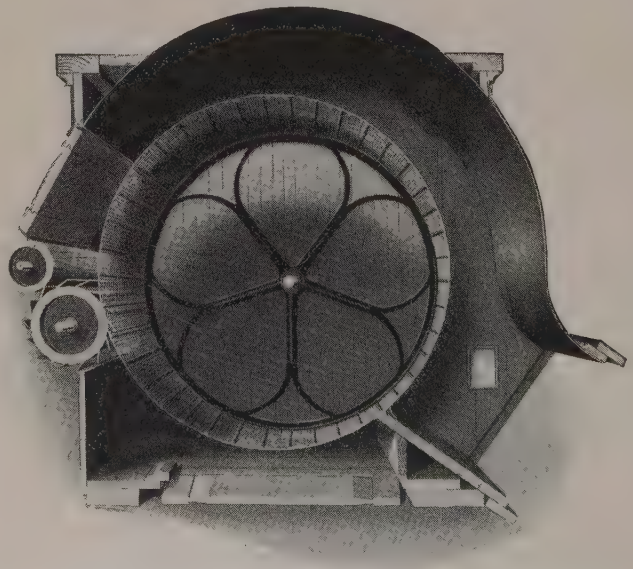
Here you see the separator and how it works. Notice the entrance for the double pipes. One of these is the pipe from the wagon and the other is the over-flow pipe. As the cotton is sucked in by the air, it passes through a screen which screens out the coarser dirt. This screen is shown just at the entrance above the weight. Then the air passes through the screen and the cotton itself drops down into the distributor, as shown in the double-page picture.



How the Gin Cleans and Seeds the Cotton and Then Brushes Its Own Teeth



At the right is an inside or sectional view of a type of gin which is specially made to handle what is called dirty cotton, that is to say, cotton containing an unusual amount of dirt, dead leaves, etc. The cotton from the feeder enters at the top and is forced down to the wheel below, which looks like a whirligig. This wheel turns toward the left very rapidly and pulls the cotton through some coarse teeth which remove the dirt from the cotton, and at the same time pull it around to the teeth of the saw. The saw then pulls it up between the ribs, as they are called, and removes the seeds. The saw-toothed wheel carries the cotton to the wheel with the brushes. The saw-tooth wheel and the brush wheel turn toward each other, but the brush wheel turns much faster and so brushes the cotton off the saw teeth and forces it out of the gin, where it is conveyed by air to the condenser shown below.



Now, let's have a look into the inside of the condenser. The cotton from the gin is forced into the right side of the machine against the screen drum. Here any remaining dirt is removed and the lint blown against the screen in a soft layer. Then the screen revolving to the left carries this layer to the rollers you see at the left, which convey it on to the baler. On the larger of the two rollers are rubber flaps which scrape the lint clean from the screen and, by the turning of the roller, push it on the bales.

Quicksilver Bob's First Steamboat

Perhaps you don't recognize him, but this is the boy who covered the sea with the giant steamships that now ply between all the great ports of the world. At the time which this picture represents, he was not the great Robert Fulton, but little Bob Fulton, known as Quicksilver Bob. Like all healthy boys he loved to go fishing, and he had a chum named Christopher Gumpf. They got tired of rowing a heavy boat a long distance when they went fishing, so Bob worked out the plan for this boat. Together they built it and you see it worked! The paddles, when not in use, they took off and hid in the thick bushes by the stream. When Bob grew up he built his famous steamboat on the same general plan, but this time he used coal to make steam instead of supplying it himself as he is doing here.

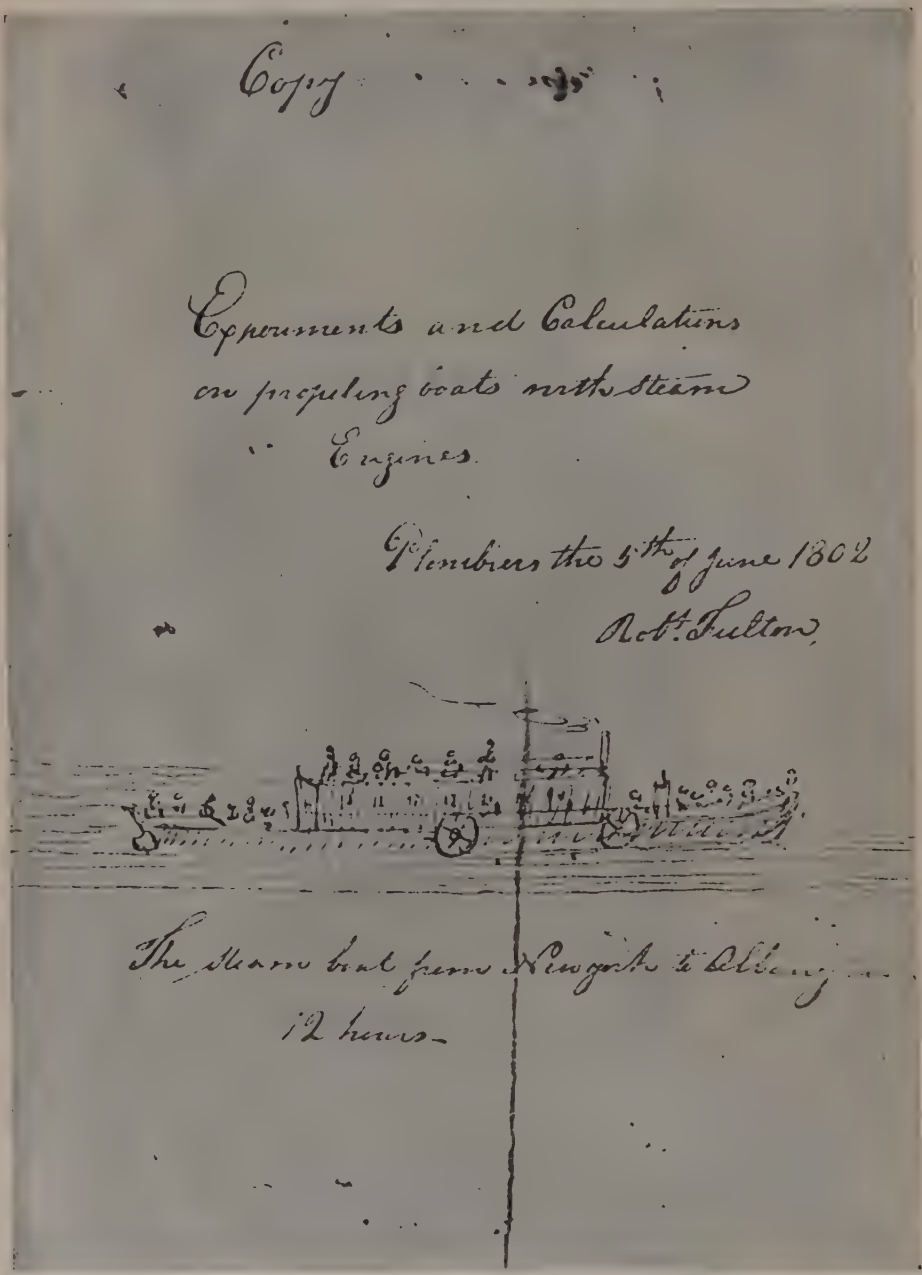
But he still remained a boy in spirit, as you can see by that playful sketch of the steamboat on the cover of his notebook. And here is something one always likes to remember about this great man with a heart of gold. On one trip of his first ferry boats across the East River to Brooklyn, the chief engineer was caught in the wheels and fatally injured. "I would give all that I am worth or ever hope to be if I could save that man," cried Fulton, and he wept like a child. He was never harsh with his workmen and they all loved to tell about his thoughtfulness of their welfare, and his habit of walking up and down the shop with the rattan cane he always carried, his waistcoat unbuttoned, the ruffles you see in the bust of him, waving from side to side as he paced back and forth for hours thinking out some new mechanical problem.

most was a paddle-wheel that he attached to a boat and turned with a crank. With this clever contrivance he beat all other rowers to the best fishing grounds. Many predicted that he would be an inventor, and, with Watt and Arkwright making such a stir in the world, invention began to look like a serious business.

Other people, however, thought young Robert Fulton was to be a great painter, like Benjamin West or Gilbert Stuart. To help his widowed mother he turned his talent for drawing to the painting of delicate miniature portraits. In this way, by the time he was twenty-one, he earned enough money to buy a farm for his mother and the younger children, and to take himself to London. There he won fame both as an artist and an engineer, and a large income that he spent in experiments. Watt's steam engine was driving all the factory wheels in England. Remembering the paddle-wheel of his boyhood fishing boat,

And He Was an Artist, too!

Fulton's Picture of the Boat that Was to Be



This picture is in the nature of a prophecy—a great prophecy that came true. It is the title page of Fulton's notebook of the experiments and calculations he made before building his first steamboat. The inventors who accomplish things, you know, are not idle dreamers who expect to get results at a bound. They work their way along, step by step. These manuscript notes are in the possession of one of Fulton's descendants, Mrs. A. C. Sutcliffe, of New York City, by whose permission this reproduction of the title page is made.

A Model of Fitch's Steamboat

John Fitch, another American inventor, conceived the two ideas of a steamboat. His first model, like that designed by Fulton, had wheels at the sides, but the following year he replaced the wheels with paddles and it is this later model that is here shown. The original is in the Patent Office at Washington. You see his idea was to reproduce the galleys of the ancient Greeks and Romans, replacing manpower by steam. Looking at this little model, one recalls Homer's fine line in the story of the Odyssey: "They smote with their well-ranged oars, the grey-green brine of the ocean."

Fulton believed that the stationary steam engine could be made to turn the shaft of a big side-wheel, and so force a boat through the water.

This was almost as simple an idea as Whitney's cotton gin, but it took years and a small fortune to work it out to practical success. His first boat, launched on the Seine in Paris, broke in two from the weight of the engine. His second failed to develop sufficient power. But, learning from his mistakes, his third steamed up the Hudson from New York to Albany. Splashing, coughing, and trailing a cloud of smoke and sparks from its pine-wood fire, it "looked like a sawmill afire on a scow," but it showed its heels to every bird-like sailing vessel on the river.

Within a few years steamboats were on every navigable stream and lake of the Atlantic seaboard. In 1811 one was built at Pittsburgh and sent down to New Orleans. With that began the great days of steamboating on the Mississippi. But the famous inventor did not live to see that, nor to see steam navigation on the ocean. While working on the design of the first steam naval vessel for the government, he died in 1812 at the early age of forty-seven, deservedly loved and sincerely mourned by the people of three countries.

Machines that Labored for Men

A dozen years later George Stephenson, fireman of a steam-pump in an English coal mine, invented the locomotive which, with the iron rail and roadbed, presented many more difficulties than the steamboat. America began to build railroads at once, but produced nothing to match the locomotive before 1840. We were not idle, however. The war of 1812, cutting off trade with England, obliged us to build more cotton and woolen mills and iron furnaces, and to supply ourselves with shoes, china, glass, paper, furniture, hats, hardware, tools, rope, and firearms. It suddenly became patriotic to use things "made in America." And after the war, manufacturing

Invention of the Locomotive

was encouraged by an import duty, or tariff on foreign goods. With the country prospering, increasing in population and spreading westward, this period was marked by an amazing number of labor-saving machines.

Houdin's Bust of Fulton

How this bust of Fulton by Houdin brings out the character of the man; the broad forehead and protruding brow of the practical thinker and the keen observer, the square chin and prominent nose of the man of initiative, the full lips expressing the warm heart and the genial smile of the social favorite.

Fulton was in the right sense, "all things to all men." He was equally at home in polite society and among the workmen in his shop who were all devoted to his interests. His complexion was fair, his hair dark brown and curly, and carelessly scattered over his forehead. His eyes were large, dark and penetrating.

Bricks were pressed and lumber was sawed and planed by machinery. There were steam hoists and dredges, and chain elevators to lift wheat and ore to the tops of mills. The friction match was invented, and cooking and heating-stoves. Pens were made of steel, paper and pasteboard of straw, and coal gas was used to light the streets of eastern cities. The first threshing machine appeared, to relieve the farmer of back-breaking toil. Pennsylvania developed her vast coal fields. Oil was discovered in 1859, and when the oil fields were extended into Ohio, Pittsburgh became the center of grimy industries. Iron was brought from upper Michigan, and copper from Lake Superior.

With the settlement of the treeless plains west of the Mississippi, Chicago became the center of an enormous lumber trade, drawing on the pineries of Michigan and Wisconsin. When the packing business grew up to supply lumber camps, emigrants and gold-seekers, new and better ways had to be found for curing meats. Canal digging, road and railroad making, bridge building, and multiplying factories, camps and mines created such a demand for rough labor that floods of foreign immigrants poured in. There were labor organizations, strikes and lockouts as early as 1830, in every northern state. All these people had to be transported, clothed, fed and supplied with every necessity of life, at constantly increasing distances. So it was under the pressure of human needs that many mechanical improvements and important inventions were made between 1840 and 1860. As timber grew scarce in the East, structural iron was used in house and bridge building. Wire rope and vulcanized rubber were made. The steam fire engine, the sewing machine, the Hoe printing press, the McCormick reaper, the photographic camera and the electric telegraph appeared in rapid succession.

How thankful Lincoln was for these inventions! They all came in

Fulton's Undersea Boat

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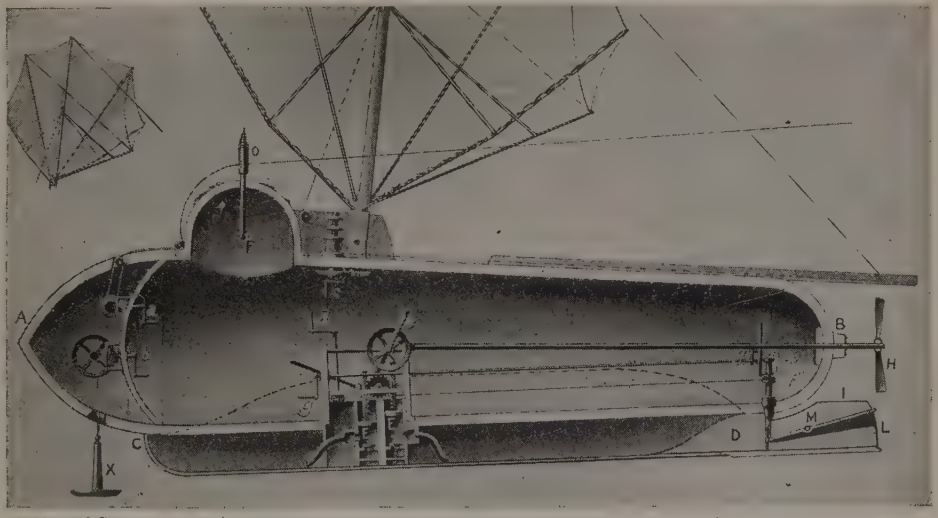
As we all know, there are vessels that travel under the surface as well as upon the surface of the sea, and that these undersea craft are used only in time of war. But how many of us know that the first man who ever worked out a practical form of submarine was the same Robert Fulton, whose inventive genius wrought such mighty changes in ocean travel and traffic in times of peace? This picture gives you a good idea of how Fulton's submarine did its work.

Instead of firing a torpedo at a vessel as is done in the use of the submarine of today, it was necessary to creep under it and screw a spike into the wooden hull. In this spike was a hole through which was passed a rope with the torpedo on the other end. Having made all these arrangements, the submarine pulled away with the cord attached to it and so made the torpedo bump against the bottom of the vessel and, exploding, blow a hole in it.

The Machinery that Made It Go



© Munn & Co. *Courtesy Scientific American*

This picture will give you a better idea of what those two men are doing in the submarine in the preceding picture. You see this submarine was to be propelled and steered by hand. The parts indicated by the letters are as follows:

A B, the shell or hull; C D, the iron keel; E E, pumps for regulating the submergence of the craft, by taking on or throwing out a small amount of water from the ballast tank; G, bulkhead cutting off the forward compartment, G A C, from the remainder of the interior, and mounting the cranks a and b which control the anchor, X, and the floating mine, through individual windlasses; F, handle attached to the barbed spike, O, which is thrust into the wooden hull of an enemy warship; H, screw propeller operated by hand power applied at e; L, ordinary rudder manipulated by handle d; I, submerging rudder, pivoted at M and controlled from lever g; c, mechanism for raising and lowering the mast and sail, Y.

time to be of wide use and to make more bearable all the dreadful horrors of the Civil War. Soldiers could leave their pictures behind to comfort their families if they never returned. The sewing machine, in house and power factory, kept the brave boys in blue and gray supplied with clothing. The printing press multiplied the news papers. The telegraph brought quick news of battles to anxious hearts; and one reaper took the place of many farmers in the fields.

The Inventor of the Reaper

Every American should know and take pride in the story of Cyrus H. McCormick, who, with an invention as simple as the cotton gin, increased the supply, and decreased the cost, of the world's bread. In his humble beginnings and difficulties overcome, he compares with George Stephenson, the English inventor of the locomotive. He was born within a few days of Lincoln, in a log cabin crowded with nine children, on a poor, rough farm in West Virginia. His father, a frontiersman of pious, Scotch Covenanter stock that had come to America before the Revolution, was a man of sterling worth and undaunted courage and resource. A backwoods mechanical genius, he made a hemp break, clover huller, and was experimenting with a reaper when young Cyrus was born.

Father and son were birds of a feather, inseparable as soon as the baby could toddle. They shared every task, and worked together on every ingenious contrivance that would lighten toil. While still a boy Cyrus began to "tinker" with his father's reaper. At twenty-one he mounted the seat and proudly clattered out of the barnyard on a machine that would cut standing grain. But it was ten years before he could make another. The farm was forty miles from a blacksmith shop, sixty from a canal,

A Man Who Kept on Smiling

When you introduce any very new thing, a machine or an idea, you must be patient and work hard, or neither the machine or the idea will get into general use. Some men bear this experience without smiling, some smile and drop their work and go at something else, but Howe smiled and went on. He had a pleasant humor, a quick wit, and a square chin and all three helped to carry him through. He also had a soft eye and a placid Quaker face (he was a Quaker) and was shrewd, as Quakers so often are. As a boy he was playful and loving and had many good chums. As a man he was so kind and sociable that even in the darkest days he never lacked friends.

Not satisfied with all the work which his machine accomplished for the government during the Civil War, he, although lame, organized a cavalry regiment, presented each officer with a horse, refused the title of colonel, and himself joined the army as a private and served until his health gave way.

You can see by his collar and coat that he lived at a later time than Whitney, for both are more nearly like those we wear today. He didn't wear his hair long to be eccentric, but like many artists, he was usually too busy to go to the barber.

How the Singer Worked in '51

This is how mother looked back in 1851 and this is the kind of a "Singer" that helped her make her pretty dresses and the dresses of the children. You see the machines were set up on the boxes in which they were shipped—no nice neat furniture about them, as we have in the sewing machines of today. Through that slot a rough wooden arm connected the wooden treadle with the balance wheel. You see this wheel didn't get its motion over a belt, as it does in sewing machines today.

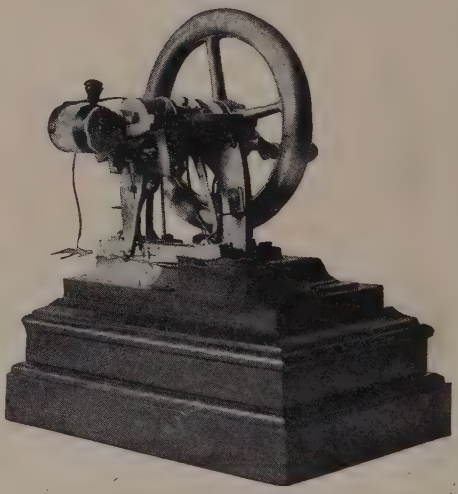
The little peg reaching out from the arm was used in starting. Haven't you noticed that mother and the seamstress always give this wheel a little whirl before they start the treadle? The poster you see on the end of the box told what a good thing the sewing machine was and how to take care of it.

and iron was seventy-five dollars a ton. In desperation he built a crude blast furnace of stones and clay, and smelted ore that he dug out of the hills with his pickax. In five years he made and sold one hundred machines.

At the age of thirty-seven, already turning gray, he had accumulated three hundred dollars. With this in his belt he mounted a horse and rode from New York to Missouri to try to interest some man with money in his invention. Most people laughed at him. Then, after two minutes' talk and a keen inspection of the model, William B. Ogden, enterprising mayor of the little city, Chicago, that built the first ten miles of railroad west of Lake Michigan, bought a half interest in the invention and furnished money to build a small factory.

The rest was comparatively easy. Five thousand reapers were sent into the fields of the prairie states to harvest grain in the summer of 1847. And with the opening of the Civil War, McCormick reapers released half a million farmer boys to fight for the Union. Europe was amazed to see the United States supporting two armies and still selling wheat in Liverpool. The use of the reaper spread to every grain-growing country in the world, and brought into cultivation millions of acres of land that must have waited long on human labor.

Howe's "Toy" Sewing Machine



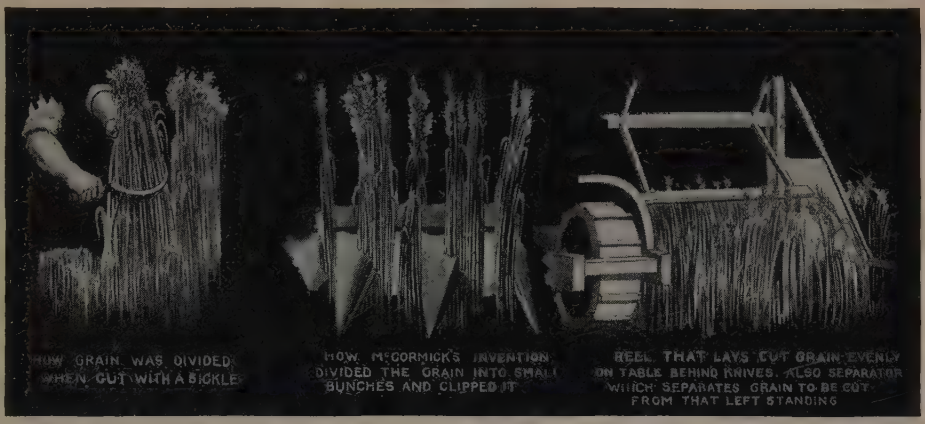
This is another one of the endless number of interesting little machines that you will see in the great mechanical "toy" shop at Washington, in the patent office. It is hard to believe, but the fact is when Howe first invented his machine, the public were interested in it as a toy but not disposed to use it. "What do you want to sew faster for"? That's a queer question to ask but that is what the people and manufacturers and everybody asked when Howe first showed his machine. So, like all inventors who succeeded, he had to be very patient as well as ingenious. When he asked tailors to try his machine, they refused because they said if it got into general use it would throw them out of their jobs. As people were already getting enough clothes to wear, what would happen if you made more clothes than there were people to wear them? Why, clothes makers would be out of work half the time! That was the way they argued. But Howe kept at it and finally got his machine into use. Among other things, it helped to win the Civil War. It provided millions of uniforms, tents, sails, cartridge cases and sewed shoes that couldn't possibly have been supplied by hand.

How easily that invention could have been lost! Made in poverty and obscurity that were all but impossible to overcome, it was received with ridicule by neighbors and with contemptuous indifference by manufacturers and capitalists over a ride of fifteen hundred miles. That we have this indispensable machine today is due, not only to the genius of the inventor, but to his courage and tenacity of purpose.

The Story of Samuel F. B. Morse

The telegraphic instrument, made about the same time, was a conquest in physics, comparable to the steam engine of James Watt. A reverent world took off its hat when the inventor tapped the first sentence: "What hath God wrought?" over the first wire from Baltimore to

The Harvest Hand with the Iron Fingers


HOW GRAIN WAS DIVIDED WHEN CUT WITH A SICKLE
HOW McCORMICK'S INVENTION DIVIDED THE GRAIN INTO SMALL BUNCHES AND CLIPPED IT
REEL THAT LAYS CUT GRAIN EVENLY ON TABLE BEHIND KNIVES. ALSO SEPARATOR WHICH SEPARATES GRAIN TO BE CUT FROM THAT LEFT STANDING

These three pictures show you how the reaper is made to take the place of the harvest hand with his sickle. The harvester grasped a little bunch of wheat with one hand and held it, while with the cycle in the other hand he cut it off. In the McCormick harvesting machine the same result was accomplished but in another way. The next time you get your hair cut, notice how the barber takes the hair between his fingers and snips it off wisp after wisp. You see Mr. McCormick worked out much the same idea in the "business end" of his harvesting machine. Then later the inventor of the hair clipper borrowed the idea for the barber who, you know, uses the clipper as well as scissors in cutting your hair.

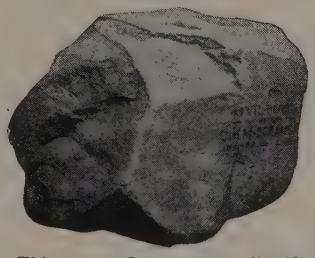
The third picture shows you how the wheel in turning laid the wheat against the blades. On the left is the separator which separated the grain to be cut, and on the right is one of the two drive wheels on which the reaper moves along.

The next picture and the explanation of it tells you how this drive wheel drives.

Washington. He had wrought a man of scientific mind, lofty imagination, creative genius, and consecration to a great task. This invention was understood at once to open up a new field of discoveries in applied electricity.

Fulton was in London, with the idea of the steamboat in mind, and Whitney was in Yale College when Morse was born, in 1791, in the parsonage of a Congregational minister in Charleston, Massachusetts. Descended from four of the best and most intellectual families in America, he had every social and educational advantage. He was graduated from Andover and Yale with distinction before he was twenty. This Puritan youth showed the same qualities of mind, interests and talents as the Irish immigrant lad, Fulton. He spent his vacations experimenting in chemistry and electro-magnetism, and he earned his first money by painting miniatures. A talent for art and a gift for invention are often found together. Both imply imagination and creative ability.

The Stone and Our Daily Bread



This stone has a very dignified look. It certainly has a right to look dignified, for it helped to make the first of the harvesting machines on which the world now depends for its daily bread. This stone did duty as an anvil in the old McCormick blacksmith shop.

A Homesick Boy's Unconscious Prophecy

At twenty years of age Morse was sent to London to study art. A homesick boy, he wrote to his mother: "I wish that, in one instant, I could tell you of my safe arrival; but we are three thousand miles apart, and must wait

The Birthplace of the Great Reaper

This little old blacksmith shop in the hills of Virginia is the very place where the farmer boy, Cyrus McCormick, first began to work out the design of the reaper. You mustn't suppose, however, from the looks of the place that McCormick's father remained poor. He came to own several farms, a sawmill and gristmill, and had shops for blacksmithing and carpentering like this on the different farms to make it convenient for repairing tools. At the age of fifteen, Cyrus had invented a cradle which he used in the field in competition with his father's hired men.

four long weeks to hear from each other."

Twenty-two years later he was on his way home from a trip abroad. He had won fame as an artist, had painted the portrait of the Marquis de Lafayette and organized the New York Academy of Arts and Design. Important commissions and eager students awaited his return. At forty-two he had no other thought than to devote his life to his chosen profession. But he still had his old interest in electricity, and in London had heard much of Michael Faraday, the famous physicist, who had recently discovered the principles of the dynamo. On shipboard were both scientists and manufacturers who were interested in electric power and transmission. Morse in the course of conversation remarked thoughtfully:

"If the current could be broken and restored at will we would have a means of quick communication."

"Interesting," said the others and promptly forgot about it. But the idea possessed Morse. Then on the deck he worked it out in a drawing that showed a battery, a charged wire, a keyboard, and a recording pencil to be moved by sparks tapped out in dots and dashes over the wire. And he seems to have decided to give up the life of honor, ease and even wealth which lay before him. On his arrival he consulted no one. His wife had long been dead, his children scattered among relatives. He disappeared into a little shop in New Haven.

But Morse Didn't Forget

Then followed twelve years of poverty, toil and ridicule; "wasted years," they were called by his best friends. Even scientists thought his idea wild and visionary. He slept in his workshop, cooked his own food, refused commissions for pictures, consented to do no more than teach an art class to pay for his bare necessities. Suddenly his name was on every tongue. His patents se-

The First Harvest Hand with the Iron Fingers

This picture shows how the first McCormick reaper was built and how it worked. A reaper has only two wheels on the ground. These are called the drive wheels because as the reaper moves forward, these wheels drive the machinery that does the reaping. One of these drive wheels has teeth on the inside of it that fit into the teeth of a wheel on one end of what is called the disc shaft, much as the teeth in the stem-winder of a watch fit into the teeth of the wheel that winds the spring. (Ask your father to show you, unless you have a "stem-winder" of your own.) This arrangement of one cogged wheel at right angles to another is what is called a beveled gear. On the other end of the shaft that connects with the drive wheel is another beveled gear arrangement which you can see in the picture.

The thing in the machine that takes the place of the harvester's sickle, is a long, straight bar with triangular blades fastened on it. The end of the sickle bar is attached to a wheel by a "peg" on one side of the center of the wheel so that, as the cog-wheel causes the "pegged" wheel to revolve, the cycle bar is given a back and forth motion which cuts off the bunches of wheat between the iron fingers.

The "paddle wheel" you see in the picture, is connected by that belt to the axle of the drive wheels. As the machine moves forward, the paddles brush the wheat up against the blades. At that time there was no device in the machine for sweeping off the wheat as it was cut, so a man followed along and raked it off as you see this man doing.

cured, he persuaded Congress to appropriate $30,000 to build a telegraph line from Baltimore to Washington. He lived to the age of eighty-one, to reap the honors and rewards of his extraordinary achievement. He saw wires stretched out to the Pacific coast and others connecting the capitals of Europe. And Cyrus W. Field had the benefit of his advice in solving the problems of laying cables under the Atlantic Ocean.

Reaping a Just Reward

Other Great Electrical Inventions

Three years after Morse died in 1872, Alexander Graham Bell invented the Bell telephone, and exhibited it at the Centennial Exposition in Philadelphia in 1876. Edison already had his first factory; and in 1880 special trains were run from New York City to Menlo Park, to see "the wizard's" town blazing with the new electric lights. Electric lighting was a novel feature of the Paris Exposition of 1889. The Columbian Exposition in Chicago, in 1893, however, had the very first building devoted to electrical exhibits. Visitors reached the grounds by electric trolley cars and third-rail elevated trains, the entire park was brilliantly lighted by incandescent lamps and arc lights, and all

the machinery was operated by dynamos. Most of this amazing exhibit was due to the genius of Edison, whose inventions covered every department of heat, light, and power. His work is so important that we have a special sketch of him among the World's Helpers.

McCormick, as a Famous Artist Saw Him

Here they are again—the square chin, the steady, level eyes, determination, patience; the power to labor and to wait. McCormick not only endured with patience the struggle to get the value of his machine recognized, but for several years, while experimenting with it, and showing its operation in the field, he refused to begin making these machines for sale until he had made a number of improvements that these experiments suggested.

Cyrus, the farmer boy, could never have thought of having this picture made when he was working in that little old blacksmith shop. It is from a portrait of him by Cabanel. Although before McCormick was grown his father had become a wealthy farmer, it would have taken several of his farms to pay the price charged by the famous painter for his work.

The little ribbon in his coat is the decoration of the Legion of Honor which was given him by the French emperor, Napoleon III, after seeing the reaper work on his farm at Chalons.

The First Iron Man-of-War

Now let us go back and trace the progress in other fields. The next important invention after the telegraph and reaper, was the "Monitor," the famous, iron-clad naval vessel with revolving gun turret that John Ericsson built for the United States for use in the Civil War. Born in Sweden in 1803, he found no market for his engineering ability at home. In London he improved the locomotive; and then he came to America where, for fifty years, he gave us the finest fruits of his genius. His most notable work was in naval construction. For Fulton's cumbersome side-wheel he substituted the screw propeller, thus securing greater stability and speed. He placed the engine-room below the water-line, where it was safer from cannon fire. Then he boldly encased wooden hulls in thick iron plates which could not be pierced by the small shells of that day. Everyone else predicted that an armored vessel would sink of its own weight. The "Monitor" was laughed at as "an iron cheese box on a raft." But its path was strewn with destruction, and it completely revolutionized naval construction and armament. Old wooden ships were thrown on the scrap-heap.

The period between 1860 and 1880 was marked by mechanical improvements that expanded many lines of industry, and by great engineering works. A self-binder was added to the reaper. Barbed wire fenced in millions of acres of treeless plains for cultivation. Machines for making tin cans made the can-

How the Twine Binder Works

NEEDLE THAT CARRIES THE TWINE
"GOOSE-BILL" THAT TIES THE KNOT
ROLLER WHICH, WHEN PUSHED BACK OPENS FINGER
"GOOSE BILL" TURNS AND FINGER OPENS
SHEAF TO BE BOUND
DISK THAT HOLDS THE TWINE WHILE THE KNOT IS TIED
NEEDLE CARRIES TWINE OVER "GOOSE BILL" AND INSERTS IT INTO A NOTCH IN THE DISK
DISK TURNS, CATCHING AND HOLDING BOTH ENDS OF TWINE
HOOK
KNIFE
FINGER OF "GOOSE BILL" HAS CAUGHT TWINE TO MAKE KNOT — KNIFE CUTS THE TWINE
HOOK HAS PULLED TWINE OFF "GOOSE BILL" COMPLETING KNOT. SHEAF IS NOW PUSHED OUT
NEEDLE GOES BACK TO FIRST POSITION, LEAVING TWINE OVER "GOOSE BILL" READY FOR THE NEXT SHEAF

Courtesy Scientific American. © *Munn & Co.*

Before twine could be used in binding sheaves it was necessary to invent a machine that would take the place of the human hand. The machine that does this is called a knotter, and it acts quite a little like the human hand in doing its work. The first picture of the hand shows the twine lying across the fingers. In the second picture of the machine, you see the needle brings the other end of the twine up around the sheaf and over the "goose-bill." This doubles the twine much as it is done by hand.

Then the "goose-bill" (which is the machine's finger) starts to turn as you see in the third picture, and as it turns, begins to open, ready to catch the above twine as it goes around. By the time it has turned entirely around, the "goose-bill" has caught the twine and holds it securely. In the corresponding picture of the hand, you will notice that the fingers open in the same way and later secure the twine. Then the hook (marked in the picture) moves to the left, pushing the knot off the "goose-bill" and at the same time the knife cuts the twine below the knot. But the twine would be pushed entirely off the "goose-bill" in this operation, and so the sheaf wouldn't get bound at all, if the "goose-bill" did not hold the two ends very securely, so that the knot be completed as you see in the fifth picture.

ning factory possible, and increased the world's supply of preserved foods. Dynamite, invented by Alfred Nobel of Sweden, and the compressed air drill aided and extended mining and oil production. Powerful elevating machinery lifted ore from deeper mines, and carried grain to the tops of tall mills and storage elevators.

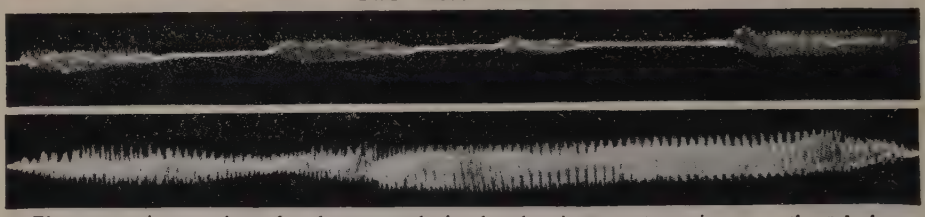
The Westinghouse air brake made travel on railroads safer, and the Pullman sleeping car trebled night travel, so the railroads could operate profitably twenty-four hours a day. The cable car, abandoned now for the trolley and the elevated third-rail system, released horses and mules from killing work, and the gas engine brought power into many a mine, shop and farm where steam could not be used. The typewriter multiplied correspondence and extended business, and the typesetting machine enlarged the newspaper. The use of wood pulp enormously increased the world's supply of paper, and chemical processes recovered the sugar from beets, and syrup from corn. Oil-refining machinery not only improved lamp oil, but gave us gasoline, machine grease and many other useful products from petroleum. In every industry mechanics and chemistry have turned factory waste into valuable by-products.

Engineering, Chemistry and Mechanics

Even while our great Civil War was being fought, gigantic engineering works were begun and some of them brought to completion. The first Atlantic cable was laid in 1866; the Union Pacific Railroad was opened to Sacramento in 1867. The Eads pier and steel arch bridge across the Mississippi River at St. Louis was completed in 1874. Ten years later suspension bridges spanned the Ohio River at Cincinnati, and the East River from New York to Brooklyn. The use of enormous quantities of steel in bridges, rails and buildings was made possible by a cheap and quick process of converting pig-iron into steel, invented by Henry Bessemer of England. The first "skyscraper" office building was erected in Chicago in 1885, by making a bridge construction framework of structural steel on a bed of concrete and railroad iron.

In the thirty years since, we have pushed three more transcontinental railroads out to the Pacific Coast; reclaimed desert lands of the West by damming mountain streams, tun-

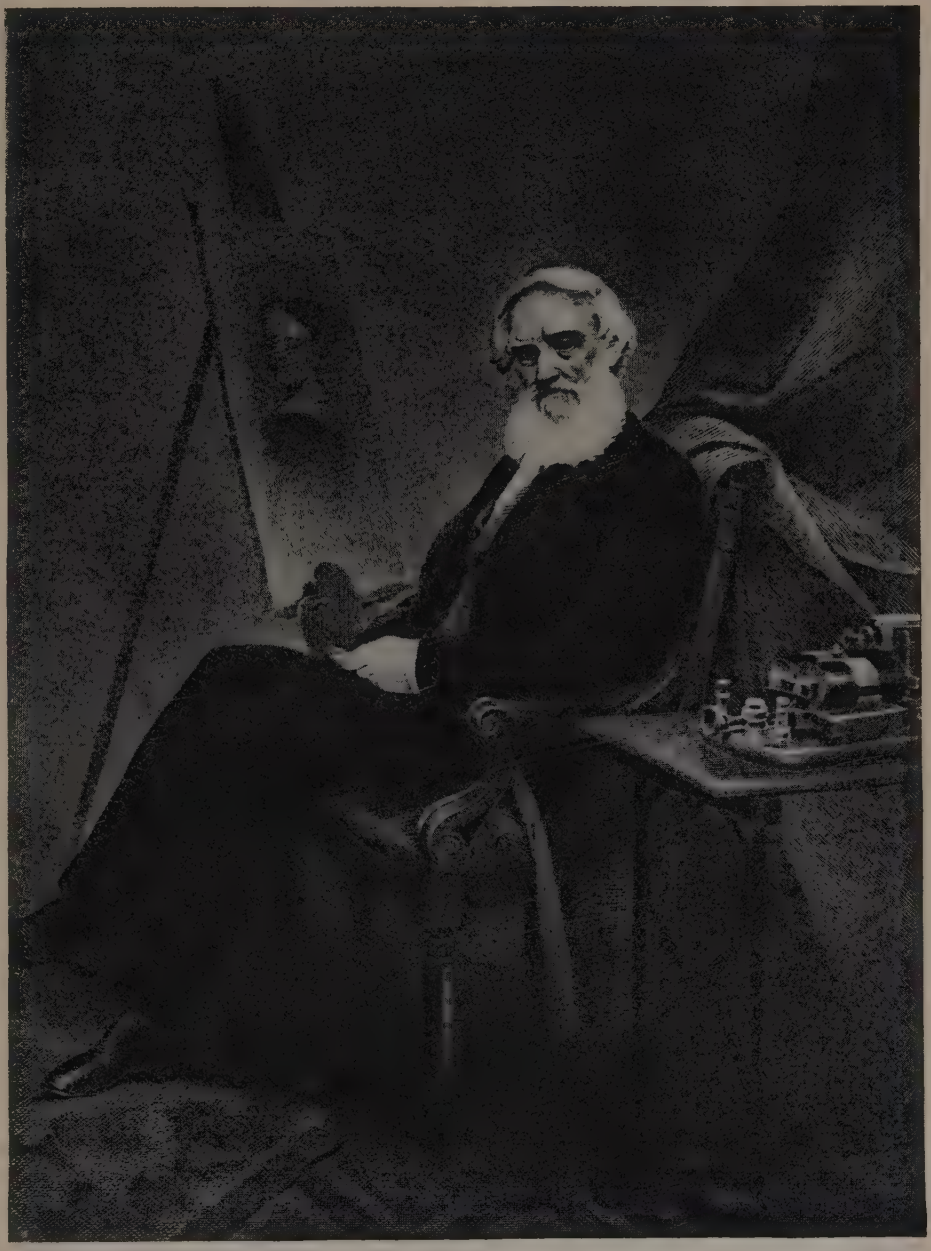
Two Voice Pictures



These two pictures show the changes made in the electric current passing over the telephone wire, when you say "New York," and when you say "San Francisco." Notice how the "sound pictures" are divided into syllables, a short wave for "New" and a longer wave for "York," while in the sound picture of "San-Fran-cis-co" there are four syllables of appropriate lengths.

When we want to say that anything was done very quickly, we often use the expression, "Quick as a wink." As a matter of fact, however, the electric waves passing over a telephone wire when you say "Hello" carry the words so fast that you would have to wink about fifteen times in a second to keep up with it; while, if your "Hello" traveled through the air without the help of electricity, it wouldn't get to San Francisco in less than four hours.

Morse and His Life in a Picture



The whole story of Morse and his character as a man is told in this picture. He was an artist, an inventor, a scholar, and a polished gentleman. He had unusual talent both as a painter and a sculptor.

That telegraph instrument always stood on a table at his side in his library, and he used to talk with it to his friends hundreds of miles away, just as we call people up by the telephone today. You see from the form of it that it was a printing telegraph, so that his friends who had an instrument just like it could read what he had to say without knowing the Morse telegraph code.

To Carry Your Voice Across the Desert

This team of six horses and two mules is hauling eleven eighteen-foot telephone poles across the sagebrush-covered wastes near Golconda, Nevada. The country is mountainous and there are no roads, as you see. Such difficulties as these have to be overcome every day, in order that every nook and corner of our big country may have a telephone line.

neling ranges, building viaducts and digging canals. We have developed the mines and transportation system of Alaska; laid cables across the Pacific; chained the power of Niagara Falls; tunneled under the Hudson River; built the colossal waterworks of New York and Los Angeles, and dug the Panama Canal. Many people think our next big task should be to control the floods of the Mississippi.

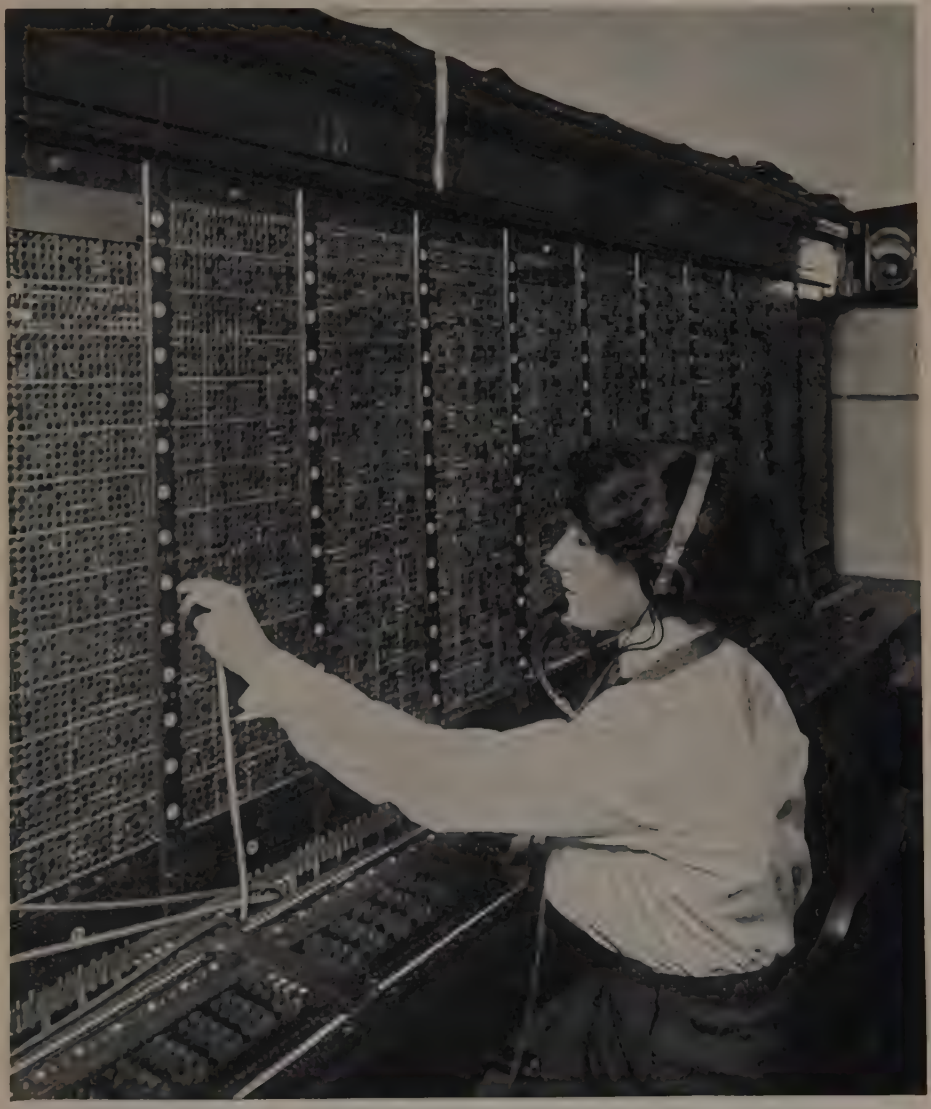
Great Work by Human Hands

The Three Great Fields of Invention

The very multiplicity of things done in this age is confusing. Let us see if we can simplify it. Discovery and invention have all been in three fields: Physics, which considers the properties and powers of steam, electricity and air; second, in mechanics and engineering; and third, in chemistry. All western countries have contributed to every line of progress, but England has the greatest honors in her physicists, working in scientific laboratories and giving their discoveries freely to the world. The United States has no one to match with Watt, Davy, Faraday and Kelvin. Germany has made the greatest contributions in chemistry. Italy and France have a few noted inventors, but the United States is pre-eminent in applied electricity, mechanics and engineering. Marconi, an Italian, invented wireless telegraphy, almost the only thing Edison overlooked, but we have capped that with the wireless telephone. And an American first navigated the air.

And this age has developed a new spirit—a brotherhood of nations in every thing progressive. You re-

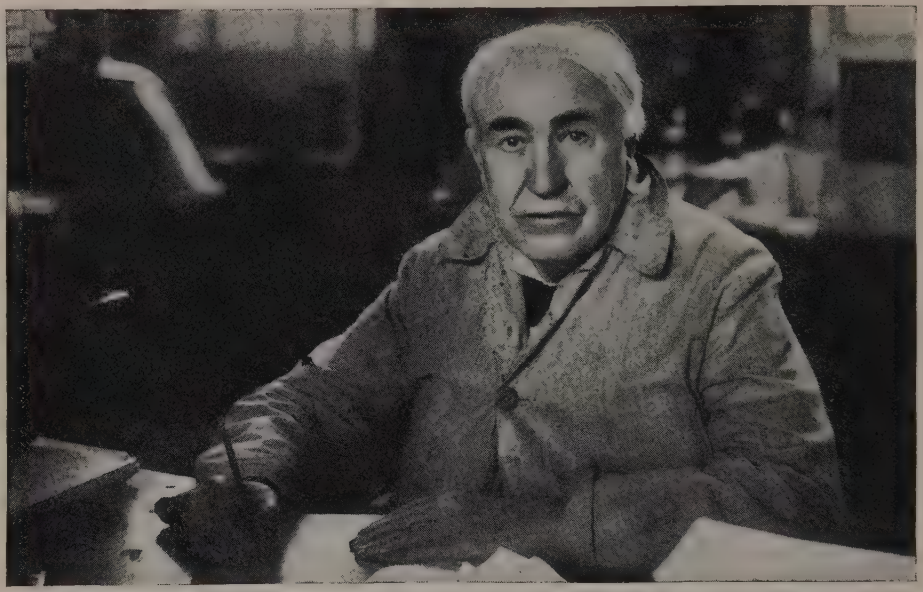
A Big City Switchboard



Each of the little plug holes in front of the operator contains the ends of the two wires running to a number. The girl at the switchboard can reach seven thousand of these holes, which the telephone men call "jacks." Now let's see what happens when Mr. A, on the Ravenswood exchange, calls up Mr. X at 585 Drexel. One of the girls at the Ravenswood switchboard sees the tiny electric light corresponding to Mr A's number flash on, and puts one of those flexible wires with a plug on the end of it into the proper hole, just as the girl is doing here. At the same time she says, "Number, please," to Mr. A through her mouthpiece. By putting the plug in the hole she has connected Mr. A's house with her own wire. As soon as Mr. A answers "585 Drexel" she puts in another plug which connects her with the girl at the Drexel switchboard—the one we see here—and tells her to get Drexel 585. This girl then puts one of her plugs in the 585 hole, ringing the bell at that number. The girl here handles no incoming calls from the subscribers directly. She receives them all from another operator who speaks the number wanted into her ear, and then this girl makes the connection with the Drexel number called for.

She is a part, you see, of a very large and complicated system. The four buttons at the base of the board are used when there is more than one phone on one set of wires, that is "when the operator wants to call a "party line." By pressing one of those buttons she makes the connection with one number on the line, without disturbing the others.

A Great Inventor and His Secret



If there ever was a man entitled to be called genius it is this man Edison. In fact, the word "genius" does not seem to have been strong enough to express the popular idea of him. He has been named "the wizard," because he has invented or perfected so many remarkable things—such as the phonograph, the electric light, the moving picture camera.

But do you know what Mr. Edison himself says a genius is? "Nine-tenths perspiration and one-tenth inspiration; and it is the perspiration that brings on the inspiration." That's his funny way of saying that what we call genius grows out of work, very much as corn grows when you work it with the hoe or plow. In this picture you see him, "all dressed up," in his workshop. When he gets that old linen duster on, things begin to happen, because he makes them "happen." You see he is figuring out something new and has just looked up for a moment to accommodate our camera man.

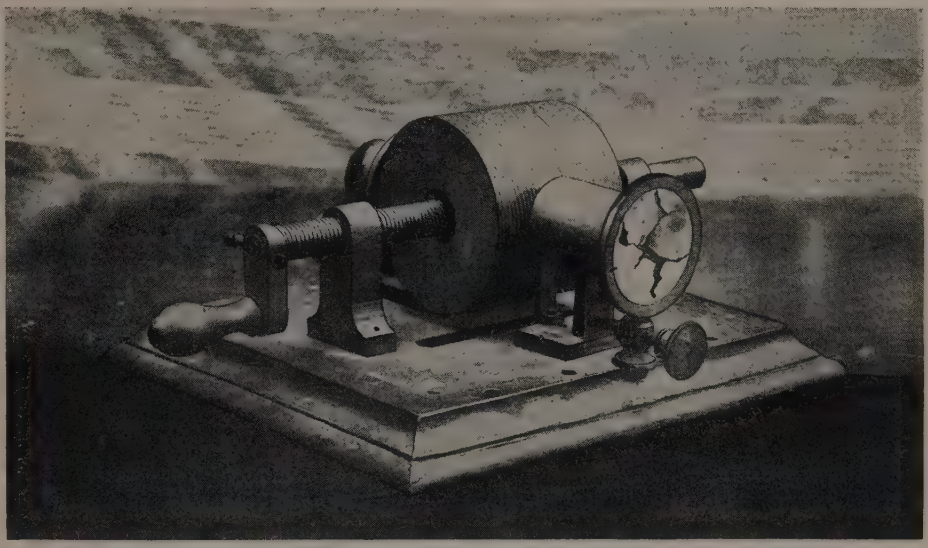
International Brotherhood of Invention

member how jealously England guarded the secrets of the steam engine and textile machines? Now, by mutually protective patents, every new invention is shared with all other countries. Usually, as in the case of the automobile and flying machine, scientists and mechanics work on the same idea, independently, in several countries, and solve a problem in different ways. The Wright brothers of Ohio built the first successful aeroplane, but they had the benefit of the mistakes, achievements, and experiments of Maxim in England, Santos-Dumont in France, and Professor Langley in Washington. There are now several types of flying machines; and Germany has developed the gas balloon into the engine-driven Zeppelin.

How One Invention Grows Out of Another

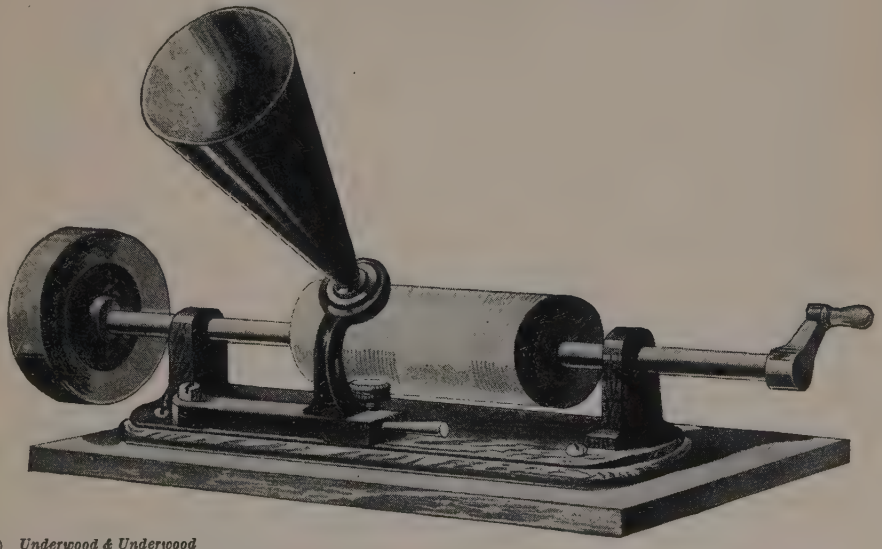
Indeed, every invention rests on discoveries of the past. The steam engine and dynamo were the result of a century of work in scientific laboratories, and their full possibilities were not at once realized. The steam pump was in use in mines a half century before the steamboat was invented and seventy years before the locomotive. Franklin captured the electric spark a hundred years before Morse sent it over a wire, and it was another generation before Edison gave us the electric light. The photograph preceded

The First of All Talking Machines



This is a model of the original Edison phonograph, the father of all talking machines. It is now in the South Kensington Museum, London. Mr. Edison had a representative in England in the early days, named Colonel Gourad, to whom he gave this model and Colonel Gourad presented it to the museum.

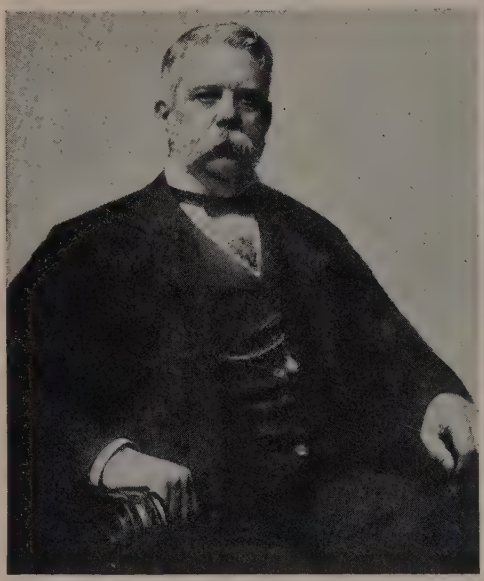
The Phonograph that Went to School



© *Underwood & Underwood*

This picture has frequently been published as the "first phonograph," but it is not. It is a model of the kind of phonograph that was first used in schools. It was made cheaply in order to illustrate to pupils, in a simple way, how the phonograph "hears" and "remembers" things. The words spoken into it were recorded on tin foil, instead of wax cylinders or discs as in the talking machines and musical phonographs of today. The heavy wheel at the left was to make it run smoothly, the wheel doing a work similar to that of the balance wheel on the steam engine. The screw and peg were for use in adjusting the recorder and reproducer.

Two Typical American Business Men



© *Gessford*

The wonderful development of America has been due not alone to the fact that we are a great nation of inventors, but that Americans are the best business men in the world. One of the most distinguished names identified with our industrial and commercial development is that of George Westinghouse (at the left) and here he is looking at you with the frank, fearless eyes and the genial expression which was one of his most attractive characteristics.

One of the stories his friends used to love to tell about him was that of his attempt to interest Commodore Vanderbilt in his air brake, when it was first put on the market. Then entirely unknown, he called at the office of the great railroad man, but when the office clerk learned his business and asked Mr. Vanderbilt if he would see him, he sent back word that he didn't have any time for cranks.

You see he was as slow about believing that you could stop a railroad train with air, as the farmers were in adopting the McCormick reaper. Some time afterward when the air brake had come into general use, it was Vanderbilt who called on Westinghouse. Extending his hand with a smile, Westinghouse said:

"I haven't got time for cranks, but I'll see you just the same." And they had a hearty laugh together before proceeding to business.

But now for the story of the invention of the sleeping car. This invention has done more perhaps than any other one thing to make travelling in comfort possible on the modern railroad, particularly in this country of "magnificent distances."

Sleeping on a train, in a narrow "Pullman" is quite different from sleeping in a big, broad bed that holds still, and some people have difficulty in doing it at first, but experienced travelers think no more of going to sleep in Chicago and waking up in Omaha, say, than you do of going to sleep in your own bed now and saying "Good morning, Merry Sunshine," the next day.

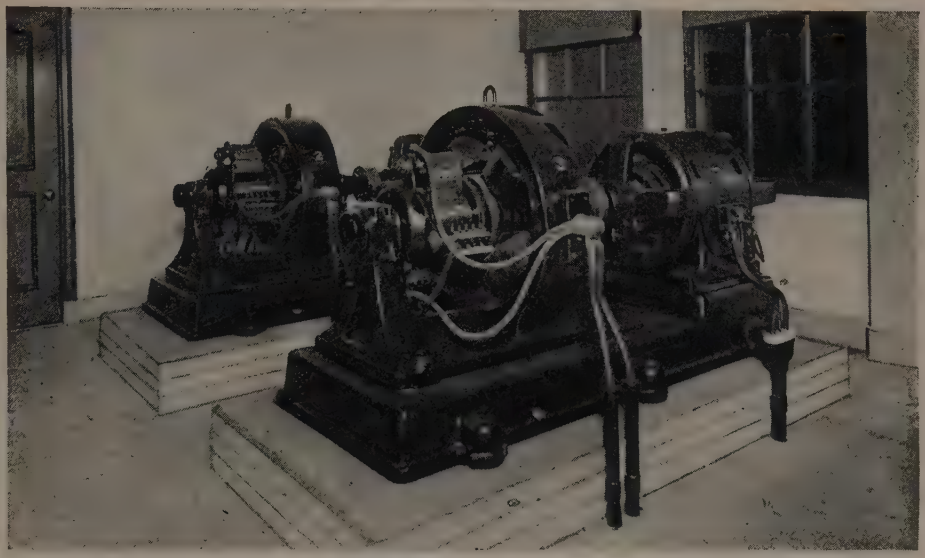
Before George M. Pullman perfected the sleeping car, there were coaches for night travelers in which you could lie down on a shelf and sleep—if you could. Usually you couldn't. These shelves had neither sheets nor pillows, and roads in those days were full of bumps.

Somebody described these sleeping cars as "nightmares on wheels." It was when going from his native state, New York, to Chicago, that Pullman put in a night in one of these cars, and it was this personal experience that led him to invent the sleeping car that is now used all over the world. Mr. Pullman's picture is shown on the right.

the moving picture by several decades, and the gas engine was long in use before anyone thought of the automobile. And, did you know that Fulton made a diving boat that would fire a torpedo under water, nearly a hundred years before the submarine was perfected for practical use in warfare?

What next? No one knows. Amazing discoveries, creations and improvements are still being recorded every year. Scientific and practical men alike place no limits upon what may be done, since the seemingly impossible has been done so often. There are still unexplored fields, unsolved problems in mechan-

The Power Room



The smaller apparatus is an electric motor which turns the armature coils of the dynamo in the foreground. In revolving, these armatures (the round, cheese-shaped affairs) generate a powerful current in the coils of wires making up the core at the center of the dynamo. From this core the current passes out over the wires enclosed in the cable at the side.

Where the Dynamo Electricity is "Made Over"

The cables from the dynamo can be seen entering the battery in the foreground at the left. This battery is composed of eleven troughs called cells, and is large enough to supply current for a very large telephone system. Each cell contains a solution of sulphuric acid, in which lead plates are immersed. The current from the dynamo sets up a reaction between the lead and the acid, generating a different and more usable kind of current which passes out of the battery through the cables at the far end, going to all parts of the telephone system. Each lead plate in connected with the long lead bar between every two cells, and thus with the plates of the next cell. The connection is made by a strip of metal which runs from each plate and is welded into the bar of lead.

How Inventors Try and Try Again

Practical ideas don't come to inventors already finished; they have to be worked out. This picture will give you something of an idea of how Edison worked out one of his many inventions, the Edison storage battery. Each of the jars on the table in the foreground is one of these batteries, but each is a little different from the other. These young men take a look at the jars from time to time to see which one is making the best record, and all these experiments put together determine how the final battery is to be made.

ics, physics, chemistry and engineering where future inventors are free to win fame, fortune and the admiring gratitude of the world. But the conditions of success remain the same. Men will need to know all that has been done in any one line before, and to possess the same qualities of mind as those who have done the great deeds of the past.

Our Political History from the Revolution to the Civil War

IF you are an American you love your country, but you are apt to think foreign lands more interesting than your own. Perhaps you know and envy some lucky friend who has traveled or served abroad and seen palaces and castles, ancient temples and cathedrals, galleries of "Old Masters" of art, and the places of dead kings, romantic lovers, and battles long ago. Compared with the countries of the Old World we have few historic shrines. Here, except for the Indian mounds and cliff dwellings, the works of man are new. Our beautiful Capital is only little over a century old. Our history appears to be only the story of the conquest of a wild continent; and our heroes are bold explorers and hardy pioneers.

Greatest Chapters in the History of Liberty

But, did you ever think that for every American who took a pleasure trip to Europe, hundreds of eager immigrants came to the United States to live? They looked upon our country as the most fortunate on earth. They were inspired to the great effort and risk of leaving their native lands, to make new homes in America, by the promise of liberty, justice and equal opportunity that they find in the Declaration of Independence and the Constitution.

Have you read these documents? They are printed in the back of your school history. They look dry and uninteresting, but really they are the opening chapters of our dramatic, national story, and the beginning of a better day in the political history of the world. People all over the earth are freer and happier today, because these were written; because the liberty-loving leaders of our Revolution had a new conception of human rights, and a noble faith in the ability and the virtue of the common man.

Unless you read them you cannot understand the principles and basic laws on which our government was founded. Nor can you understand its subsequent history; the mistakes we have made and paid for in blood and tears, the dangers which may threaten us again, from within and without. Nor can you understand your own duties and privileges as a citizen. When you grow up, you know, you must help conduct public affairs and safeguard our free institutions.

The Study of Citizenship

Begin by reading the Declaration, and thinking what the world was like at the time it was signed. It enumerates a long list of grievances and injuries, which England thought it entirely within her rights to inflict upon loyal

colonists. The services of foreign soldiers could then be bought. King George III hired 29,000 Hessian Germans of their Grand Duke, to fight his own subjects in America. The notion that "all men are created equal, with a right to life, liberty and the pursuit of happiness," was a bomb shell in the royal courts and camps of Europe.

France did help us with men, ships and money. But, while the French people sympathized with us, it must not be forgotten that the King of France had long been at war with England. Only a dozen years before, England had conquered all the French possessions in America, and France was glad to see her lose her rich colonies in return. King Louis soon had cause to regret his help, and to be alarmed at our success; for the French Revolution broke out in 1789, and a monarchy a thousand years old was overturned. The empires and kingdoms of Europe combined to punish France, to restore her royal family to the throne, and to beat back the rising tide of republicanism. If people could rebel and set up self-governing republics no monarchy would be secure.

Our Great Experiment in Government

This task of fighting the armies of France under Napoleon, kept England busy for twenty years. She had no thought of attempting to reconquer her lost colonies. Indeed, many of her liberal statesmen rejoiced that they were free. But with her powerful navy she continued to interfere with our sea-borne trade and there were long disputes over the surrender of the interior trading posts. So, "to provide for the common defense," as well as to secure public order and credit, national responsibility, and the prosperous development of the country, the thirteen states were obliged to form "a more perfect union." They framed a constitution, set up a federal government, and claimed a place in the family of nations.

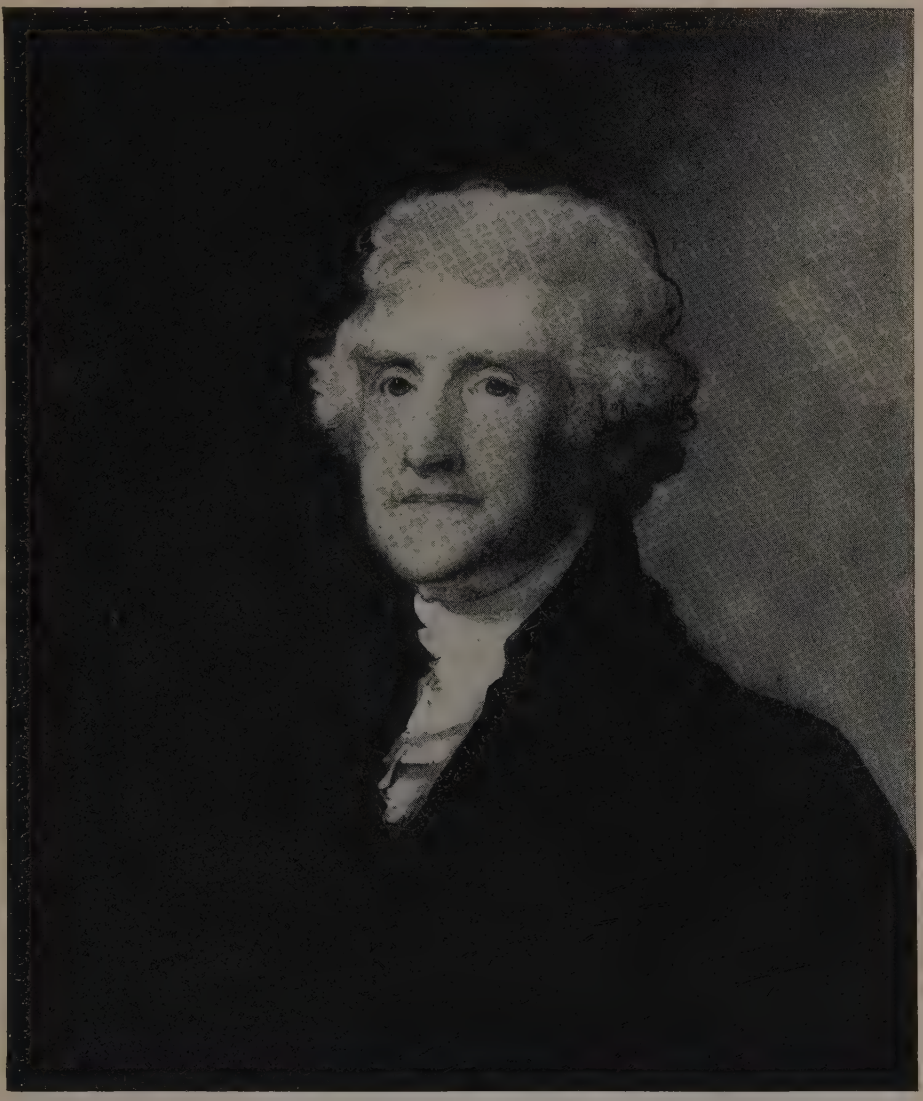
This was a doubtful experiment. Government by the governed had succeeded in The Netherlands, but that was a small, compact country, whose people were mostly Dutch and of similar habits, interests, and opinions. In America there were people of every nationality of western Europe, scattered from Maine to Georgia, and inland to Kentucky. Ninety-seven per cent of them were on farms. This population was sure to be increased by unknown elements, for we offered asylum and citizenship to the discontented of all lands. The country, too, had already begun to expand across a vast, unexplored wilderness, and pioneer life to develop a new type of self-reliant men remote from the seat of government. And one-tenth of our population of 3,000,000 people were Negroes, who were held in slavery. A few men like Benjamin Franklin and Patrick Henry, saw the inconsistency of slave-holding in a free country, and thought it so dangerous that it might yet disrupt the Union. You can see that the best, wisest, and most liberal statesmanship was needed to build, launch and pilot our new Ship of State.

Perils of Our Ship of State

Slow Growth of the National Spirit

We had a very solid foundation to build on, however. The people then in the country had brought with them a thorough knowledge of

Gilbert Stuart and His Jeffersons



Gilbert Stuart, one of the greatest of early American artists, painted several portraits of Jefferson. The original from which this one was copied was painted in Philadelphia, when Jefferson was fifty-seven years old and was serving as vice-president. His coat is a velvety, grayish black, the background is a dull, neutral olive tone, as in most of Stuart's paintings. Stuart was first of all a portrait painter. He cared little for the rest of the body or the surroundings of his figures, putting all his emphasis and good work on the head. He would tell clever anecdotes of his interesting life to his sitters, trying to kindle them to interest and thus bring out their most characteristic and natural expression. He was wonderfully successful in reading people's true characters, and in catching their most typical expressions on his canvases. It usually required only four or five sittings for him to complete a picture. The face in this portrait is that of a simple, kindly, intellectual gentleman, and that is what Thomas Jefferson was. We are told that he was "over six feet tall and very erect. His features were delicate, his eyes a bright hazel, his hair auburn, his complexion ruddy." He was one of the most scholarly men of his time, a good singer and violinist, a graceful dancer and an excellent horseman. He was a deep thinker and a brilliant and forceful writer, as he has proved for all time in his writing of the Declaration of Independence, but he was never a successful public speaker. He carried his democratic beliefs to the extent of being careless about his dress, sometimes going about in shabby clothes and down-at-the-heel shoes because he thought fine dress and display of all kinds to be wrong.

local self-government in England, and this had been used as the model for the self-governing colonies of America. And the English system of courts and common law, legislative bodies and administrative offices had been established everywhere. But the political experience of the people, in managing the affairs of the thirteen states that had risen from the old colonies, was both an advantage and a disadvantage. The states differed in size, population and climate, industries, wealth and social ideals. The little states feared the big ones, and the lower classes were jealous and suspicious of the upper. And except in the way of trade, much restricted by England, none of them had had any dealings with the outside world.

It is not surprising, therefore, that there was an exaggerated notion of the dignity and importance of the state, and a limited conception of the nation. The United States of America was looked upon as an artificial thing, created by the states for their convenience and safety. Until long after the Revolution there was intense local, and then sectional, patriotism. But love and loyalty to the country as a whole, was a plant of slow growth.

The Loose Confederation

Until four years after the Revolution the country was governed by the same loose confederation that had almost lost the war. We really had thirteen small, independent countries, which maintained little armies, and passed laws that created disputes and hampered trade. With no means of paying the public debt incurred in the common defense; no revenue for general expenses; no credit; no power to regulate domestic or foreign trade, or even authority to enforce peace between the states, the country drifted rapidly toward helplessness and ruin.

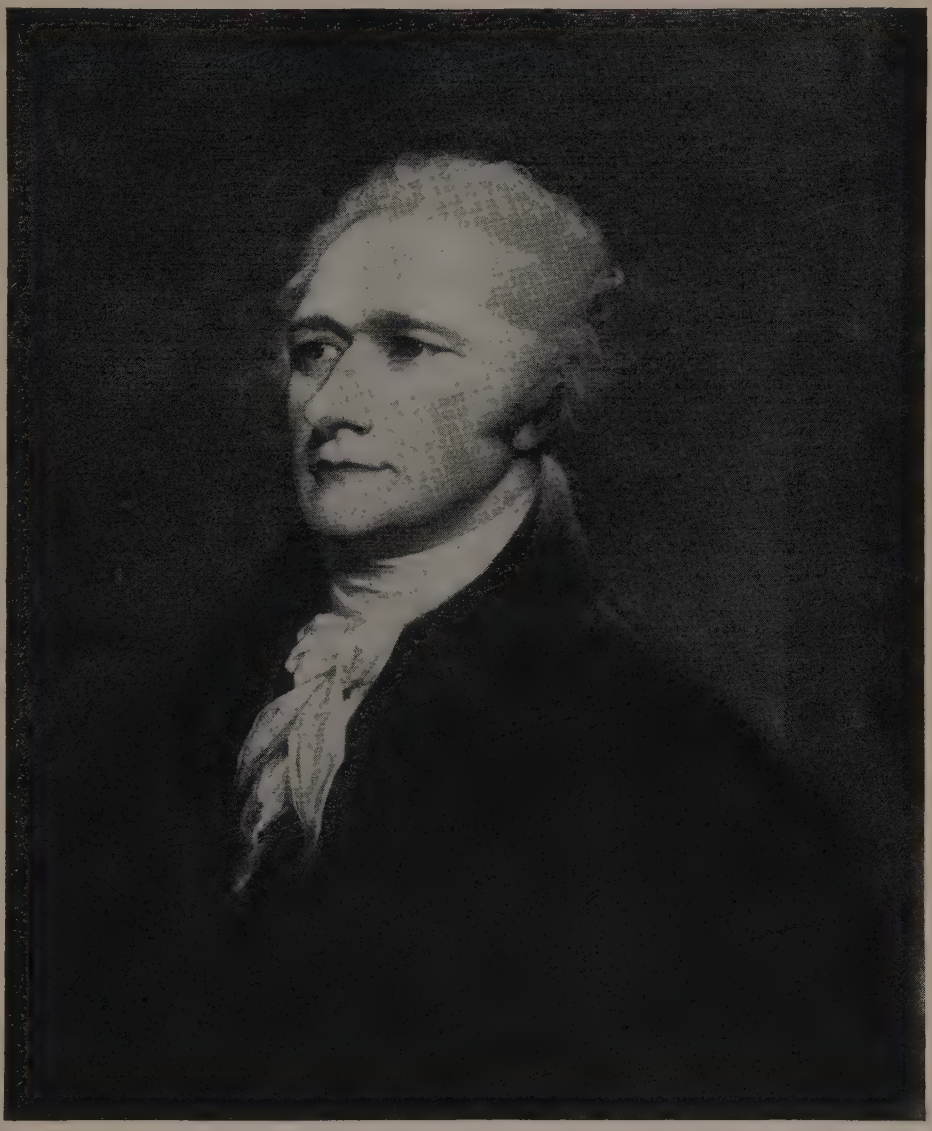
First Step Toward a Binding Union

In 1787 a Constitutional Convention was called, to devise some plan of closer union. Everyone was agreed in demanding a republican form of government. But the debates over the Constitution and afterwards developed two widely differing opinions as to the form of republic that would be acceptable to the people. As these two views have permeated, and must continue to permeate all our law-making and political practice, it is necessary for every citizen who expects to take an intelligent part in the government of the country, to have a clear understanding of them.

Jefferson's Idea of Union

One of these conceptions of government was held by Thomas Jefferson. You have had a sketch of the author of the Declaration, and his lofty political philosophy. The apostle of personal liberty, he had a sublime faith in the right and the ability of every man to govern himself. He wanted only enough government to secure public order and safety, and he firmly believed that, even in a republic, a strong central power, supported by an army and navy and with ample revenues, would lead to the same tyranny and corruption as in a monarchy. He insisted upon home rule for every state, city, county, township, and village in the country. He thought the defense of the nation should be left largely to the state militia, and was the champion of free trade. The followers of Jefferson called themselves Democratic Republicans.

Trumbull's Portrait of Hamilton



Alexander Hamilton was short and slender, erect and dignified. His eyes, as you see, were deep-set and dark, his hair light. This portrait of him is by John Trumbull, and is one of the finest that that great historical painter ever executed.

Hamilton's manners were charming and, for so great a man, his simplicity was marked. Today we still feel the influence of his clear thinking and sound judgment in our interpretation of the Constitution and the powers of the central government. The alert, bold poise of the head, the steady eyes and firm mouth of this portrait show that Trumbull has caught the spirit of the man—his intense feeling, aggressive mind, determined will, and high courage. The original painting is in the Boston Museum of Fine Arts, but it is so popular that we see copies of it everywhere.

Opposed to Jefferson was a party led by an equally ardent patriot, and one of the greatest political thinkers and writers of the day. It is difficult now to realize that we might so early have missed having the ideas and the services of this brilliant statesman, who shares with Jefferson the glory of having founded our republican institutions.

Alexander Hamilton was born, the son of a Scotch father and a French mother, on the little West Indian Island of Nevis, in 1757. His father failed in business, so the boy was obliged to take a clerkship in the office of a West Indian importing merchant. But at thirteen he showed such remarkable gifts of mind and strength of character, that friends of the family raised funds to send him to King's College, New York (now Columbia University). At seventeen he wrote letters to the press, in defense of the rights of the American Colonies, that were ascribed to the noted lawyer and diplomat, John Jay. He was in the army at nineteen, commanding a company of artillery, and was soon made an aide-de-camp on Washington's staff.

During the eight years of the war Hamilton studied for the New York bar, became such an authority on sound finance that he was often consulted by William Morris, that patriotic banker of Philadelphia, and formulated his theory of republican government. Washington was a quarter of a century older than Hamilton, but profited by his political views. So did John Adams, John Jay, William Morris and James Madison.

Hamilton had an imperial imagination. He foresaw the vast extent and high destinies of the United States of America, and insisted that, in a world ruled by kings, who were hostile to republican ideas, the country should guard itself against the dangers of internal weakness and division of authority.

Hamilton's Idea of Central Control

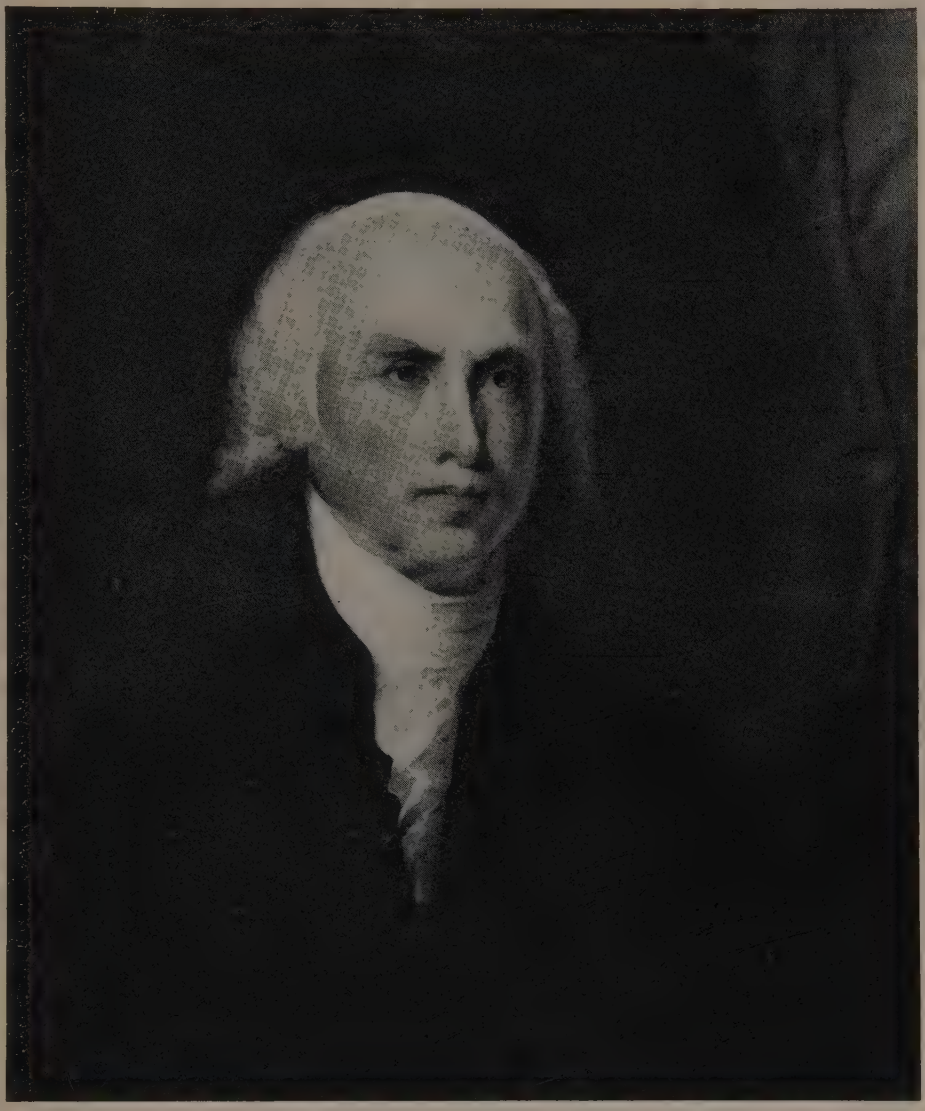
He thought that the federal government should be superior to the states in everything that affected the general welfare, and that the President and Congress should be supported by an adequate army and navy and ample revenues. He conceded the principle of home-rule in local affairs to the states, and thought that this, together with a wide suffrage, frequent elections and limited terms of office, should make the country secure against official tyranny and corruption. Men of Hamilton's opinion were known as Federalists.

The Great Compromise in the Constitution

The groups which favored and opposed a strong Federal government were so evenly matched in numbers and eminent leadership, both in the Convention and in the State Conventions that ratified the Constitution, that the only solution possible was a series of compromises. Consequently, each party has honestly found, in the fundamental law of our government, authority to put its principles into practice. Administrations have, at times, shaped laws and events toward Jefferson's view, and at times toward Hamilton's. Thoughtful historians are of the opinion that this elasticity is a source of strength. The country bends this way and that, in obedience to the popular will, but it has come through every crisis without breaking, and has even stood the strain of civil war.

Now, although the country was

Madison the Scholar President



Gilbert Stuart's portrait of Madison shows us a dignified little man with the pale face of the scholar who burns the midnight oil. His hair itself was light but, as you see, following the fashion of the time he wore a powdered wig. When Madison first appeared in the Virginia Legislature at the age of twenty-five, his clothing was so somber, so different from the gaily colored garments of the fine gentlemen about him, that people took him for a preacher.

People who knew him said that James Madison was an interesting talker, didn't lose his temper easily and was always ready to laugh at a good joke. He was considered the broadest and most accurate scholar among all the well-informed, keen-thinking men of that day. Henry Clay thus contrasted him with Jefferson, whose lifelong friend Madison was: "Jefferson had more genius, Madison more judgment and common sense. Jefferson was visionary, Madison cool and practical." As a young man he was the champion of religious freedom and absolute separation of church and state. As an old man, he watched the development of slavery with growing sorrow, and never failed to regret the presence of the institution in America.

For the story of how this learned, dignified gentleman fell in love with and married pretty, saucy Dolly Todd, the belle of Washington, read our story of Dolly Madison.

divided between the Federalists and the Anti-Federalists, in the first presidential election, there were no party organizations as we know them today. Regardless of his opinion, every man trusted and wanted Washington; and he, never a bitter partisan, persuaded both Jefferson and Hamilton to accept places in his cabinet. But two such strong men of opposite convictions could not work well together, and Washington's sympathies were with Hamilton.

No "Entangling Alliances"

In Washington's two terms there were serious disputes over the assumption of state debts, the tariff, and the establishment of a national bank. Jefferson advocated free trade and state banks. The cabinet was disrupted over the French Revolution. Since France had helped us, Jefferson insisted that we should go to the help of the French people in their struggle for liberty. It was a generous impulse, but European countries had been fighting each other for a thousand years, and Washington and Hamilton thought we should keep out of Old World quarrels—make no "entangling alliances."

This was our first international policy, and it is one to which all parties later subscribed. Even the Democrats soon saw the wisdom of it. A Democratic president, James Monroe, twenty-five years later, announced that the United States would not permit European governments to interfere in the New World "for the purpose of oppressing or controlling" the free governments there. This is the famous "Monroe Doctrine," formulated to protect the republics of Mexico and Central and South America, which had rebelled and won their freedom from Spain. The "Monroe Doctrine," consistently followed for a century, has saved us endless trouble. European governments accepted it unwillingly, but only one serious attempt was ever made to dispute it. Taking advantage of our Civil War in the sixties, Emperor Napoleon III of France attempted to force an empire on Mexico. This ended in failure and tragedy to a foreign prince when, at the close of our war, the United States obliged the French troops to withdraw.

Birth of the Monroe Doctrine

Beginning of Our Two Great Parties

Disagreements in Washington's cabinet were so serious that Jefferson resigned and organized the Democrats for active opposition to the administration. James Madison, then a senator from Virginia, deserted the Federalists and joined the forces of Jefferson. With James Monroe and Edmund Randolph, the Democrats had four able leaders, three of whom afterwards held the office of president for eight years each. The Federalists were left in control of the government, and elected John Adams for one term, but they also had to organize to fight a large and energetic minority.

Thus were born our two great political parties. The Democratic party, although it has often been divided into factions, and even split in two, has kept its name and identity down to the present day, and is still true to the principles of Jefferson. The Federalist party has had a different history. With the death of Washington in 1799, and of Hamilton in 1804, it was left without able leadership, and went into

Democrats and Republicans

eclipse. With the War of 1812 it disappeared altogether. But Hamilton's principles lived, in an important faction of the Democrats, and events conspired to revive it about 1830, under the name of the Whig Party. The Whigs flourished for more than twenty years, under as brilliant political leadership as this country has ever seen, and elected two presidents. The northern Whigs joined with other Free-Soil parties in 1856 to form the Republican party of today. Republicans still form Hamilton and Lincoln Clubs, after their two greatest leaders; Democrats form Jefferson and Jackson Clubs.

Why Political Parties Are Necessary

Political parties are necessary in a self-governing country. Their function is to determine the few questions of greatest public importance which need attention at any one time, to state opposing views as to how those matters should be dealt with, and to line up the voters for team-work, as in a match game. The stronger team, that is the party with a majority of the votes in a majority of the states, wins the game, and is said to be "in power." While in, it runs our government as literally as steam runs a locomotive. If it abuses its power it is liable to be defeated at the next election.

Like a Football Game

The minority keeps its organization in training and on the watch for any weakness or foul play of the party in power. And smaller parties, working for some reform, have much influence by voting with the big party that will help them most. No important body of public opinion can be ignored, if it is organized. And every citizen who would take an intelligent and influential part in the government of his country, must belong to a party, and work with it for definite ends. If he changes his opinion he can, of course, change his party.

The history of a party is written in the biographies of its leaders. The Federalist party died for lack of leadership. The early Democrats were more fortunate. Jefferson lived until 1826, and he was succeded by Andrew Jackson, who left his party so strong that it survived his death in 1845. So, with the inauguration of Jefferson in 1801, the Democrats came into a power that they held, with but two interruptions, until 1860 and the Civil War.

Washington, Jefferson and the Third Term Precedent

Jefferson served eight years. Following Washington's example, he refused a third term. Both thought it dangerous to our free institutions for one man to remain in office too long. Thus a Federalist and a Democrat established a patriotic precedent that has never been broken.

Experience has shown, too, that it may be equally bad for one party to remain in power too long. Even if it does not become corrupt and tyrranical, it tends to perpetuate one viewpoint, and to stand in the way of progress. The people could not possibly trust the wisdom and patriotism of Jefferson more than they had trusted Washington; but many states had become alarmed by twelve years of Federalist rule, and the Hamiltonian policy of strengthening the power of the federal government. These were re-

Value of Change in Office

assured by the election of Jefferson, champion of states' rights. This was a good thing, for in these early days dissatisfied states looked upon secession from the Union as the proper remedy for any and all political ills. Virginia threatened to secede if her state sovereignty was encroached upon, and Kentucky and Tennessee for the opposite reason—if the government failed to come to their relief and compel France and Spain to open the Mississippi River to their commerce.

Jefferson and the Louisiana Purchase

Jefferson settled that matter by taking $15,000,000 from the United States treasury and buying Louisiana from France. He "stretched the Constitution" according to his own doctrine, in order to acquire a magnificent trade beyond the Mississippi, and benefit the three states west of the mountains. Washington or Adams would probably have done the same thing, very certain that they were acting within their constitutional power. Both parties had the same motive,—to benefit the entire country, and to add to the power and credit of the United States, by giving it an immense public domain. This is one of many striking incidents in our history which prove that, in an emergency, a patriotic president of any party can usually be trusted to do the right thing. The "Monroe Doctrine" is another instance, and the "Force Bill," by which President Jackson compelled South Carolina to obey the tariff law passed by Congress, is another.

Jefferson's long term in office was marked by a national vision that Federalists were surprised to find in him, but his foreign policy was attacked with bitter criticism. He satisfied his own party by cutting down the public debt, reducing the army and navy, and stripping his office of ceremony. "Jeffersonian simplicity" freed our White House of the elaborate etiquette of royal courts.

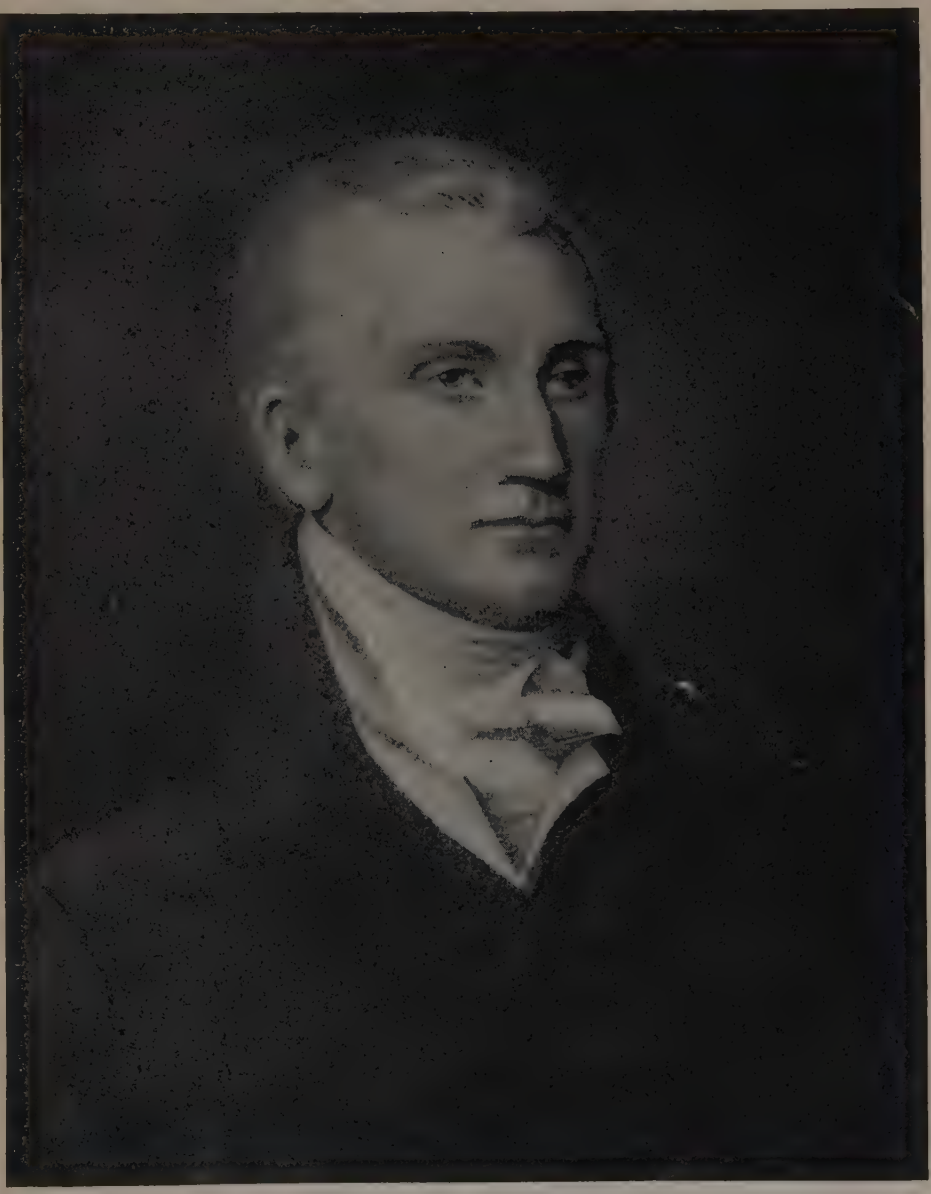
Meaning of "Jeffersonian Simplicity"

Why We Won the War of 1812

As you know, we had a second war with England in 1812. This had long been foreseen, but because of the Democratic policy of reducing the army and navy, the country was unprepared for it, and the militia of the states was unequal to the task. And it should be clearly understood that we won this war after unnecessary loss, and the bitter humiliation of having our capital burned. And we won it only because England could not give her entire attention to us, while engaged in the European coalition which overthrew Napoleon. She made peace with us in December, 1814, to leave herself free for the decisive battle with Napoleon at Waterloo in the following August.

The Napoleonic wars spread to America as early as 1810. When Spain was conquered by French armies, the Spanish colonies in Mexico, and Central and South America seized the opportunity to rise in rebellion. President Monroe promptly recognized the new Spanish-American republics, and courageously challenged the monarchies of Europe to interfere with them. In the days of wooden navies, driven by sails, it was indeed a serious undertaking for any foreign power to attack us. For quite a hundred years the Atlantic Ocean was a real protection to us, and we were left to work out our destiny in peace.

The Man Who Gave Us the Monroe Doctrine



James Monroe was six feet in height but so stoop-shouldered that he did not look that tall. He was a fine looking man, as you see. His deep-set eyes were mild and grayish-blue, and even as a young man he was deeply wrinkled. Monroe, like so many of the great statesmen of the Revolutionary Period, was born in Virginia. He came of mixed Scotch and Welsh parentage. He held various public offices under both the state and national governments, and was especially successful in foreign diplomacy. He is most famous for the Monroe Doctrine which did not originate with him, however. It was one of the many sound political principles which Washington recommended, but it was Monroe who crystallized it in its present form in a message to Congress, while he was president. Credit for some of its provisions must also be given to Monroe's able secretary of state, John Quincy Adams.

But this ocean was no barrier to the republican ideas that flowed from the New World to the Old. France was conquered in 1815, and her ancient royal family restored to the throne—for a time. It was, indeed, not until 1871 that the French Republic of today was finally established on the ruins of the second Napoleonic Empire. But in the meantime the power of the King of England was much limited, and that of her people enlarged, and home rule was given to the big British colonies. Italy fought for freedom, and united her petty kingdoms and principalities under a constitutional monarchy. The several hundred petty states of Germany were reduced to thirty-eight, which were later combined by Bismarck into the German Empire. Greece and the Balkan States slowly won their freedom from Turkey; Nihilism aroused Russia from sleep and freed the serfs; and Japan emerged from her age-old hermit despotism into an enlightened and progressive country under a constitutional emperor. The Revolution started a mighty wave of liberty that, in one century, rolled around the world.

A World-Wide Wave of Liberty

Origin of the Tariff Question

Our troubles were chiefly internal. We had to learn how to govern ourselves. It had been foreseen that it would be difficult to mete out equal justice to every one, in such a big and varied country, where the needs of one section might be the opposite of the needs of another. But no one foresaw the animosities that were to grow out of the tariff, or duty on all foreign goods entering the country, which was Hamilton's device for providing a revenue for the federal government. The Democrats believed in free trade, but they could not suggest a better way to raise necessary revenues, and they finally accepted the principle of a tariff for "revenue only." This system of indirect tax was fair enough, bearing equally on all the states, in exact proportion to their use of foreign manufactures, as long as the entire country was largely agricultural.

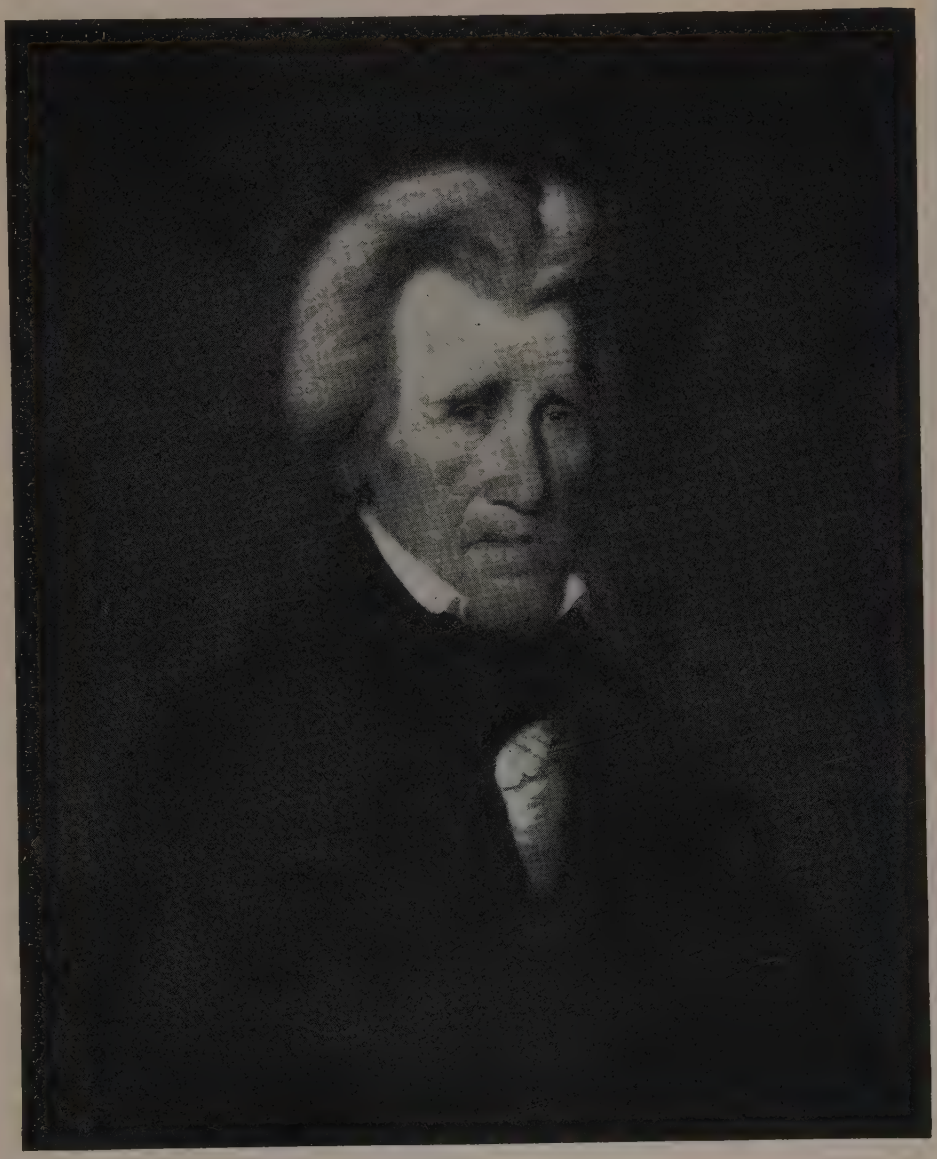
The War of 1812, however, brought about an unexpected change. The embargo imposed by Jefferson, by cutting off trade, suddenly obliged us to go into every sort of manufacturing. But the factories were all built in the northern states by those "handy" Puritan Yankees, and by the Dutch, Quakers, Scotch-Irish and Germans, of New England, New York and Pennsylvania. The southern states, with their large plantations, numerous slaves and simple crops, remained agricultural.

The Tariff, Slavery and the Civil War

When peace was signed, English goods poured in, cutting prices. This delighted the people of the South, who, having to buy nearly everything they used, wanted things cheap. But the new factories of the North were threatened with ruin. When the tariff was raised in 1816, for the avowed purpose of protecting home manufactures, there were cries of distress from the South. No scheme could be devised by which the South could have free trade and the North protection. So a bitter struggle for the control of Congress, and of the tariff question, arose between the two sections.

It seemed highly probable that the northern states would gain and keep the control, for they were increasing rapidly in population by foreign immigration to their indus-

The Character of "Old Hickory"



Painting by Earle, National Gallery of Art, Washington

Andrew Jackson's long, narrow face, deep-set eyes, tight-lipped mouth, and square chin tell a story of his character that cannot be mistaken. You know how his daring campaigns against the Indians in the South won him the nick-name "Old Hickory," and you know how he was twice wounded in duels which originated in bitter quarrels. He was a stubborn man, for once an idea or a prejudice took root in his mind it was hard to change it. And he was hot-tempered. As a soldier he was dashing, very popular and absolutely without fear. His personality was so strong and his popularity so great, that he was able to oppose one of the doctrines that was widely held in his party—that of states' rights—and at the same time become his party's most powerful leader. The election of Jackson marks the advent to power of the new turbulent "backwoods" democracies of the West. Compare his face with that of Madison, the scholar, and Washington, the dignified, thoughtful statesman, to see if you can find evidence of the difference in their personalities.

trial cities, and the pioneer movement to the region around the Ohio and the Great Lakes was adding to the number of states. Ohio, Indiana and Illinois were all admitted to the Union by 1818. Emigrants would not go into the southern states, the political thought of the day, the line of division between the free and the slave states. It was inevitable that there should soon be a sectional division of political parties.

You must remember that, immediately following 1812, there was

Jackson's Duelling Pistols

This is a picture of Jackson's duelling pistols in a portion of the box in which they were kept. The lid has disappeared with the barbarous custom of duelling itself. It is easy to see the wisdom of our laws which do not permit men to carry deadly weapons in times of peace. Duels were most common of all in the times when every man wore a sword.

where, with unpaid black labor, there was no employment for them. So the South saw the only chance of keeping its proportionate representation in Congress, in the extension of slavery into new agricultural states west of the Mississippi.

The Famous Missouri Compromise

It was in this way, and not, at first, as a moral issue, that the institution of slavery entered national politics. The first battle in Congress was fought over the admission of Missouri in 1820. It came into the Union as a slave state, but under the famous "Missouri Compromise," by which it was agreed that, in all future states north of its southern boundary, slavery should be prohibited. But this very compromise served to make visible to only one party in the country—the Democratic. But by 1820 the tariff, slavery and states' rights questions had split the Democrats into four factions, two in the North, two in the South. In 1824 there were four presidential candidates, each of whom claimed the name of Democrat. The protective tariff views of manufacturing New England and the West prevailed in the election of John Quincy Adams.

He called himself a *National* Democrat, a name very suggestive of the old Federalist party. And do you recognize the influence of his ancestry? His father, John Adams, the early president, was still living. His son held Democratic principles with Hamiltonian leanings. A few years later he was one of the organizers of the Whig party,

which advocated Hamilton's political philosophy. Adams, Henry Clay and Daniel Webster were the leaders of the Whig party, which became identified with the interests and social ideals of the northern states. The Democrats, uniting under the leadership of Andrew Jackson, became the party of the South.

Democracy and the South

Had the two sections been solidly arrayed against each other, there would have been secession and civil war fully a generation before Lincoln's election. But there were some Whigs in the South and many Democrats in the North. Henry Clay, the leader of the Whigs in the House of Representatives, was from Kentucky; and up to the war Illinois was represented by Democratic senators. And there was division in both parties. Clay, of Kentucky, for instance, differed on many points with Adams and Webster, of New England; and John C. Calhoun, of South Carolina, was a more uncompromising states' rights man than Andrew Jackson, of Tennessee. In both parties the more moderate view was held in the states west of the mountains. This accounts for Lincoln's understanding and sympathy for both sections. Born in Kentucky, in 1809, he grew to manhood near the Ohio River in Indiana, in a region of the country where Jackson and Clay had nearly equal following.

The tariff was finally hammered down to the old "revenue only" basis in 1842. But long before this question was settled satisfactorily for the South, slavery had become a menacing issue.

At some time slaves were held in all the colonies. But Negroes did not thrive in a cold climate, nor could they be used profitably in the many complicated tasks of the small farms and workshops of the North. There slave-holding was gradually abandoned, and it was on the decline in the South when a fresh impetus was given to it by the invention of the cotton gin. Millions of acres of wild land were cleared and planted to this simple crop, that could be grown with slave labor, from the Gulf to the Ohio and Missouri Rivers.

At that time the extension of slavery into the territories and new states was opposed in the North chiefly because it would restrict the field of free white labor. Benjamin Franklin had helped form the first Abolition Society before 1800, but it was not until 1831 that abolition sentiment had grown to the point to justify William Lloyd Garrison in beginning the publication of *The Liberator* in Boston. Soon thereafter John Quincy Adams represented an anti-slavery wing of the Whigs in Congress. After 1833, when England abolished slavery throughout the British Empire, a strong moral feeling against the institution developed throughout the civilized world. In some of our border states the gradual emancipation of the slaves was seriously considered.

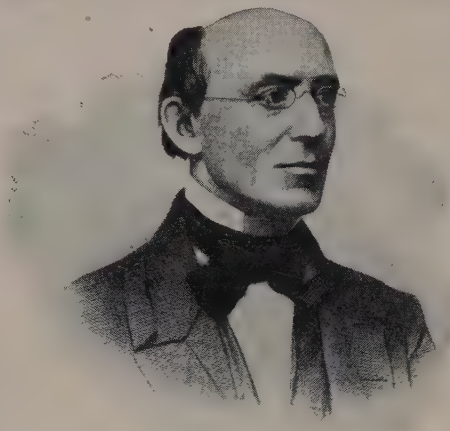
Growth of Abolition Sentiment

But the organization of strong abolition and free-soil parties in the North, and the establishment of "under-ground railway systems" by which runaway slaves were helped to escape to Canada, aroused alarm and resentment in the South. The industrial system of the South was based on slave labor, and sudden emancipation without compensation to the owners of slaves, or

The "Underground Railway"

provision for the freed Negro, would have brought ruin and anarchy to half the country. The Constitution had sanctioned the existence of slavery, a thing that Northerners were prone to forget or to ignore. Many plans were proposed for the gradual emancipation of the slaves, together with their removal to a separate Negro state or colonization in Africa; but none of these met with much success.

William Lloyd Garrison and the Liberator



Wm. Lloyd Garrison.

William Lloyd Garrison looks more like a mild school-teacher or preacher than the man of fiery eloquence and grim determination that he was. He got his education in the type-setting room of a printing office, and even when he was very young he advocated reforms that were many years ahead of his time. He was hunted out and dragged through the streets by a howling mob more than once, and put in jail for libel when he denounced the men who transported slaves from one place to another. But through it all he managed to print his paper, The Liberator, and to remain firm in his doctrine of immediate and absolute liberation for all the slaves. It was his tireless energy and clear, forceful way of presenting his arguments which helped the abolition sentiment to grow, until it pervaded the whole North. Unlike many radical reformers, Garrison lived to see this reform accomplished. After the Civil War was over and the Thirteenth Amendment abolishing slavery forever was passed, William Lloyd Garrison closed The Liberator office, because its work was done. Its motto showed the breadth of Garrison's views, which are more and more being realized among civilized nations: "Our country is the world—our countrymen are mankind." And these words, uttered in the course of one of his abolition speeches, show the character of the man: "I am in earnest—I will not retreat a single inch—and I will be heard."

Instead of healing, the breach widened. Talk of secession was heard in both sections of the country. A free republic for the North and a slave republic for the South was thought, by many, to be the best solution. But as early as 1830 the most eloquent voice in the country, that of Daniel Webster, was heard pleading for the Union, and for a national patriotism that would settle all differences justly and peaceably.

Webster's Plea for Union

For quite twenty years the two sections were very nearly evenly matched in Congress. Arkansas and Florida, and Texas by annexation and war with Mexico, were admitted as slave states. The free states added Michigan, Wisconsin and Iowa. There were long and bitter fights over Kansas, Nebraska and California, —in Kansas taking the form of pro-slavery and free-soil colonization, and civil war—but all came in free.

Between 1845 and 1852 the Democrats and the Whigs lost five great leaders by death, and both parties began to break up. The northern Whigs, uniting with the Abolitionists, Free-Soilers, and Know Nothings (an anti-foreign party) formed the Republican party in 1856, and began to develop a number of young and vigorous leaders. Abraham Lincoln who, as a Whig, had served a term in Congress ten years before, was one of the founders of the new party in Illinois. Then the Democrats were divided into Northern and Southern factions by the Kansas-Nebraska bill, and by

The Dred Scott Decision

the famous Dred Scott Decision of the United States Supreme Court. By this decision slaves were declared to be property—not persons—and that they could be taken into any state or territory without loss of ownership by the master. Thus slave-holding could not be prohibited in the territories and all attempts to prevent its further spread were against the Constitution.

The North, this time, was alarmed. Many northern Democrats went over to the Republicans; and the Lincoln-Douglas debates in 1858, and John Brown's raid on Harper's Ferry, in 1859, a heroic but ill-advised attempt to incite the slaves to rebellion, divided the Democrats hopelessly, crystallized anti-slavery sentiment in the North, and resulted in Lincoln's election to the presidency. Before his inauguration in March, 1861, several southern states had seceded, and the war was begun by the firing on Sumter.

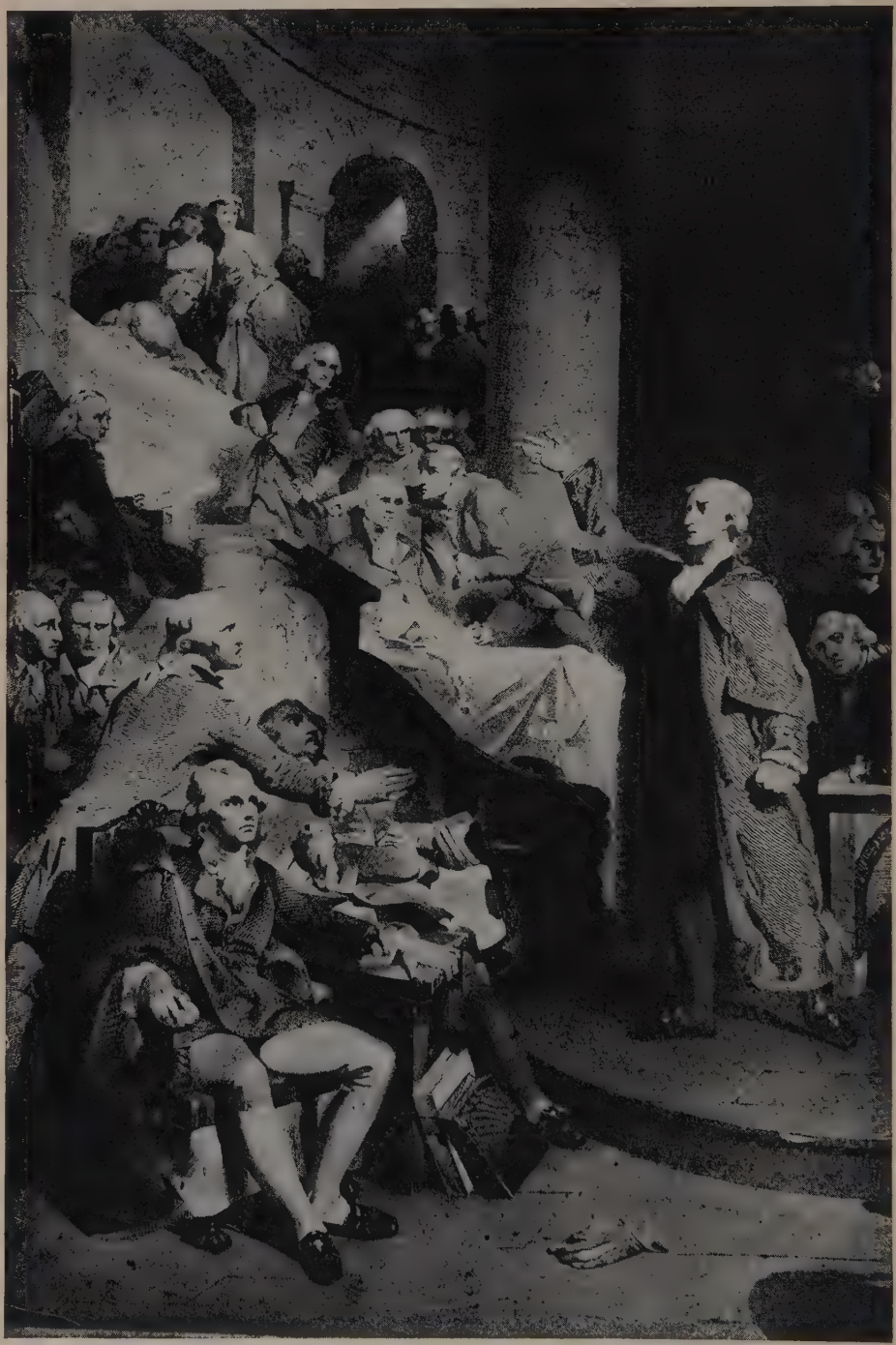
You can, perhaps, best understand Lincoln and other leaders of the Civil War period, both northern and southern, by knowing more of the troubled times in which they grew up, and of the great Democratic and Whig leaders who, for a generation, prevented the disruption of the Union. Two of them served as President; three were in Congress, orators who ranked with Patrick Henry and Lincoln, in what has been called the Golden Age of American Oratory.

The Tide River

Clear and cool, clear and cool,
By laughing shallow and dreaming pool;
Cool and clear, cool and clear,
By shining shingle and foaming wear.
Under the crag where the ouzel sings,
And the ivied wall where the church-bell rings,
Undefiled, for the undefiled.
Play by me, bathe in me, mother and child.
Dank and foul, dank and foul,
By the smoky town in its murky cowl.
Foul and dank, foul and dank,
By wharf, and sewer, and slimy bank.
Darker and darker the farther I go,
Who dare sport with the sin-defiled?
Shrink from me, turn from me, mother and child.
Strong and free, strong and free,
The floodgates are open, away to the sea.
Free and strong, free and strong,
Cleansing my streams as I hurry along
To the golden sands and the leaping bar,
And the taintless tide that awaits me afar,
As I lose myself in the infinite main,
Like a soul that has sinned and is pardoned again.
Undefiled for the undefiled.
Play by me, bathe in me, mother and child.

CHARLES KINGSLEY

The Climax of Henry's Speech



1620

The Golden Age of American Oratory

THE period which immediately followed the disappearance of the last of the Revolutionary heroes was the one, in American history, which produced the greatest number of political leaders. The date is easily fixed, for Thomas Jefferson and John Adams died on the Fourth of July, 1826, while the country was noisily celebrating the fiftieth anniversary of its independence. Both had reached an advanced age and had, in truth, outlived their time.

Patrick Henry on Fire

This is a painter's conception of the scene in the Virginia House of Burgesses when Patrick Henry made the historic speech in which he referred to the fate of Charles I as a warning to George III. "Caesar had his Brutus," he cries with that gesture of his right hand as if pointing to the past, "Charles I had his Cromwell, and George III—" "Treason! Treason! Treason!" shouts the speaker. "Treason! treason!" echo the royalist members. Then the orator adds "and George III may profit by their example. If this be treason, make the most of it." While this picture is widely known and identified with the great event which it represents, and expresses well the spirit of the occasion, we must remember that it belongs to the old school of art which dealt more in symbols than in the details of historic events. The House of Burgesses had no classic pillars as here represented, nobody started to draw his sword as the British officer in the background is represented as doing, and there was no glove on the floor. The one shown in the picture is to express, after the classic manner, that Henry is throwing down the gauntlet to the king and to his royalist supporters in the colonies.

Party politics had become a dramatic feature of a more varied American life. North and South had begun to find in themselves irreconcilable differences; and pioneers, on the westward march, were discovering new needs and problems. Politically, the country was divided into warring factions, with every election a conflict of sectional interests.

An Era of Political Strife

Let us review a little, to avoid confusion. The two big parties, you remember—the Democratic and Federalist—were organized by Jefferson and Hamilton. Because of the folly of its later leaders, the Federalist Party soon disappeared. John Adams had the ability and the experience to lead it, but failed to win popularity. But he and his son kept some of Hamilton's principles alive in a New England wing of the Democracy. This, together with opposing views in the South and West, split the Democratic Party into four factions. About 1830, however, two of these factions united to form the Whig Party, which revived much of Hamilton's teachings. There were, again, two clearly defined parties in the country.

Radical Differences Within the Parties

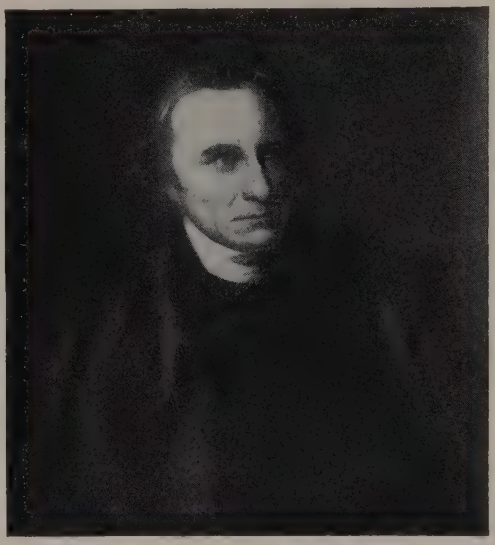
But within party lines the Whigs were divided into three factions, each with its leader, and the Democrats into two. So, for the next twenty years, there were five political leaders in public life. All of them were aware that the

country was drifting steadily toward civil strife, but, because of honest differences of opinion, were unable to agree upon what should be done about it. These men were John Quincy Adams, Daniel Webster, and Henry Clay, who led the Whig Party, but who differed radically on vital questions; and Andrew Jackson and John C. Calhoun, both Jeffersonian Democrats, but who interpreted Jefferson's teachings differently and quarreled bitterly.

All of these men were born in the Revolutionary period, between 1767 and 1782, when the nation was not in existence, and patriotism was for the state; and they all entered public life in the formative years of the young Republic: Adams in 1794, Clay and Jackson by 1800, Webster and Calhoun before the War of 1812. Clay, Webster and Calhoun were orators of the first rank.

One of the Revolutionary traditions that is usually overlooked, as having a profound influence on the next two generations of Americans, was the pride of the country in the fiery oratory of Patrick Henry. The people were stirred by eloquence in the pulpit, at the bar, and on the stump, as by nothing else. Every boy burned to be an orator, and an astonishing number of gifted public speakers were developed in the first half of the nineteenth century. There was an unbroken line of them from Patrick Henry to Lincoln. Lincoln was able "to think on his feet," and to move audiences to tears or laughter, at the age of twenty-two.

How Patrick Henry Took Fire



Patrick Henry was not really Patrick Henry until he warmed to his work. When he made a speech he rose very awkwardly, and faltered and almost stumbled along at the beginning as if feeling about in his mind for the right word. In a few minutes, however, excited by the occasion, he seemed absolutely transformed. His action became graceful, bold, and commanding, and the tones of his voice like music. A man who heard him make the great "treason" speech said that his eyes seemed actually to flash lightning. "In less than twenty minutes," he says, "the audience in every part of the house, on every bench, and in every window, were leaning forward in death-like silence, their features fixed in amazement and awe."

This was in 1831, when Webster, Clay and Calhoun were at the zenith of their powers and fame. For fully a quarter of a century every important speech which they delivered in the National Capital was printed in the smallest newspaper, to the exclusion of every other sort of news. And scarcely second in importance were the public activities of Andrew Jackson and John Quincy Adams. All this furnished a liberal education in public affairs to young men who, seriously concerned about these troubled times, were unconsciously preparing themselves to take charge of the country during the perilous years of the Civil War. From biographical sketches of these leaders, see if you can figure out for

yourself the influence of each on Lincoln's character and political convictions.

The Democratic Leaders

During the first forty years of its history, the United States found its presidents in Massachusetts and Virginia, and from the class of scholarly gentlemen who had led the Revolution. Andrew Jackson, who served from 1829 to 1837, was the first chief executive to appear from the region west of the mountains. Originally poor, and self-educated, he was a typical product of the rough, pioneer period which followed the frontier era of Daniel Boone. A man of arrogant temper, independent opinions, blunt honesty, indomitable courage, and broad patriotism, he was one of the most original and forceful characters who ever appeared in the arena of American public life.

Character of Andrew Jackson

Born of Scotch parents, in a new and poor settlement in South Carolina in 1767, Jackson was to have been educated for the ministry; but the early death of his father left the family in poverty. As a boy of thirteen he saw service in the last years of the Revolution. After the war, his adventurous spirit and impatience of restraint, led him to seek the lawless wilds of Tennessee. There, before Washington's inauguration, he educated himself for the bar. A man of iron strength and tireless energy, he was soon busy prosecuting law-breakers, fighting Indians, and directing the labor of slaves in clearing a cotton plantation out of the wilderness near Nashville.

On the outbreak of the War of 1812, he organized forces of volunteers to conquer the red tribes of the South, which, armed from British forts in Canada, harried the frontier all the way to the Gulf. This task required two years, won him the nickname of "Old Hickory" for his extraordinary endurance of hardships, and also won for him national fame and a major-generalship in the regular army. Taking four thousand troops, he defended New Orleans against twelve thousand British regulars. This brilliant victory of January 8, 1815, is still celebrated by the Democrats as Jackson Day.

Jackson's Military Exploits

A hero on horseback, General Jackson rode into national politics, appearing in Washington as United States senator from Tennessee, just at the time when the Jeffersonian Democrats were looking around for new leaders. The country had never seen such a paradox as this gentle but fiery, forceful, tender and brave, crude but efficient frontier lawyer, Indian fighter and shrewd politician. He soon captured the popular imagination, and it presently began to appear that the leadership of the party would be safer in his hands than in those of the intellectual statesman and gifted orator, John C. Calhoun. He represented the more conservative views of the West on the tariff and slavery questions; and was one of the first public men in the country to insist that the federal union was superior to the states.

Although true to Jefferson's principles of free trade and state sovereignty, destroying the United States bank in the interest of the state banks, yet Jackson rebuked the extreme states' rights view of Calhoun, his own vice-president, that a state could refuse to submit to an act of Congress. When South Carolina, Calhoun's state, repudiated an un-

popular tariff law, President Jackson joined with the Whigs to put through the Force Bill, which gave to the president the power to use the army and navy to compel rebellious states to obey federal laws. He intended, as he said, "to stamp this treasonable nullification doctrine" out of his own party. At a banquet he proposed a toast which Lincoln might have proposed thirty years later: "The Union—it must be preserved!" Calhoun followed with the defiance: "Liberty, dearer than Union!"

Jackson and the Nullifiers

In the face of such division, in the hard times which followed his destruction of the United States bank in 1837, and of the loss of the election of 1840 to the Whigs, Jackson held his party together and ruled it like an autocrat until his death in 1845. He left his party in power, and so well organized that it presented an unbroken front until split in two by the Lincoln-Douglas debates in 1858.

Secret of Jackson's Power

The immense political power that Jackson gained and held for twenty years, in the most turbulent times, was due in part to his personal popularity. Without that, leaders of the greatest ability and experience, like John Adams, have failed. But Jackson also had the qualities that win enduring fame. His sincerity, honesty, and patriotism have never been questioned. And his services were important. He played a large part in preventing the disruption of the Union, and in delaying the Civil War. And he gave to a divided people a dramatic lesson in national patriotism. In Democratic annals he takes his place beside Jefferson, and later leaders of the party have been rated as they approached the measure of these two.

Jackson was not quite just to Calhoun, the very able Democratic statesman and brilliant orator who, in trained intellect and manners, was his superior. Calhoun was, indeed, a belated Revolutionary, who would have felt more at home among the philosophical gentlemen in Independence Hall, than in the boisterous, rancorous days in which he found himself.

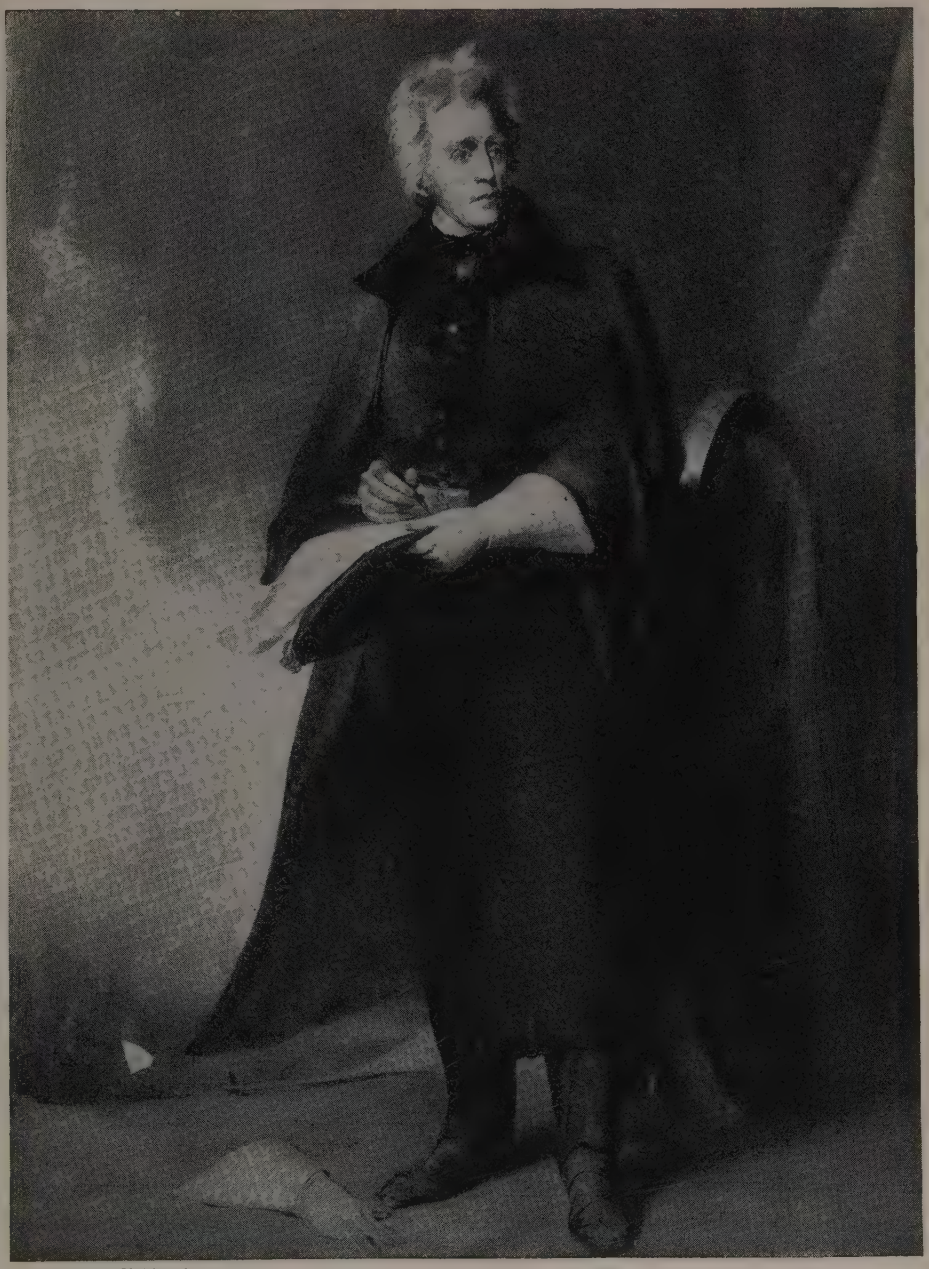
Character and Abilities of Calhoun

His father had been a friend and disciple of Jefferson, and the son had often heard him quote from the Sage of Monticello: "That government is best which secures to the individual the largest amount of personal liberty that is compatible with public order."

Born in 1782, Calhoun was graduated from Yale College in 1801, with the reputation of a hard student and fine debater. Equally marked for his integrity of character and for his capacity for clear thinking, a brilliant career was predicted for him. Jefferson's inauguration, and the beginning of a long period in power for the Democratic Party, opened the way for Calhoun's early entry into public life. An influential member of Congress, and an orator of proved powers before 1810, he was conspicuous in opposing the protective tariff legislation which was the most serious domestic consequence of the War of 1812. To an ardent Southerner of his convictions, the imposition of a tax which burdened the South, for the benefit of manufacturing states of the North, partook of the nature of that centralized tyranny which Jefferson had feared.

Leading the revolt of the south-

Jackson, the Man of War



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Thomas Sully, who painted this picture of Andrew Jackson, was one of the greatest of early American painters. He shows us a fiery, alert old man in a military cloak below which the scabbard of a sword is seen protruding. Beside Jackson is a cannon and behind him the smoke of the battlefield. He has pulled off one gauntlet and is signing an order, using his cocked hat for a writing pad. The whole picture expresses the quick, decisive character of Andrew Jackson. The original is in the Corcoran Gallery in Washington.

ern seaboard states, Calhoun defended the right of South Carolina to refuse to obey the federal tariff law, and even to secede from the Union. He held his own in a debate with Webster, on the nature and the rights of the federal and the states' governments, that was one of the most eloquent and instructive in the history of the nation. He was defeated by the passage of Jackson's Force Bill; but he had made so strong a plea for justice to the South, that Henry Clay persuaded the Whigs to consent to a gradual lowering of the tariff.

His Debate With Webster

Of all the defenders of the institution of slavery, Calhoun was the most brilliant and convincing. From the time of the Missouri Compromise in 1820, until his death in 1850, he fought for the extension of slave-holding into the territories and new states. He brought about the annexation of Texas, and his policies were responsible for the bitter fights over Kansas, Nebraska and California.

That Calhoun was sincere and personally disinterested, no one doubts today. To his own disadvantage he led a violent faction within his own party. His defiance of Jackson cost him the presidency. Twice he rose to the vice-presidency, only to see men of lesser ability and distinction preferred for the higher office. He denied that he had any desire to disrupt the Union and head a southern republic. If he had had any such ambition, he could, at least, have split his party and brought Jackson to defeat. Remaining loyal, under severe provocation and bitter disappointment, it seems much more probable, today, that he kept his own followers from going to extremes. He had been dead ten years, and less able and more unscrupulous men were in control in his section of the country, when South Carolina seceded in 1860 and thus precipitated the great Civil War.

The Leaders Among the Whigs

Of all the political leaders of his period, the seventh president of the United States, who was the son of the second, was the most fortunate in his birth and education. He had a remarkable father and mother, who founded one of the most distinguished and patriotic families in America. John Adams gave thirty-five years to the service of the struggling colonies and to the establishment of the republic. And his wife, as you know, was "the Portia of the Revolution." The son devoted sixty years to his country. And every generation of Adamses since, has furnished its able and learned men, brought up in the tradition of service and sacrifice owed to the United States.

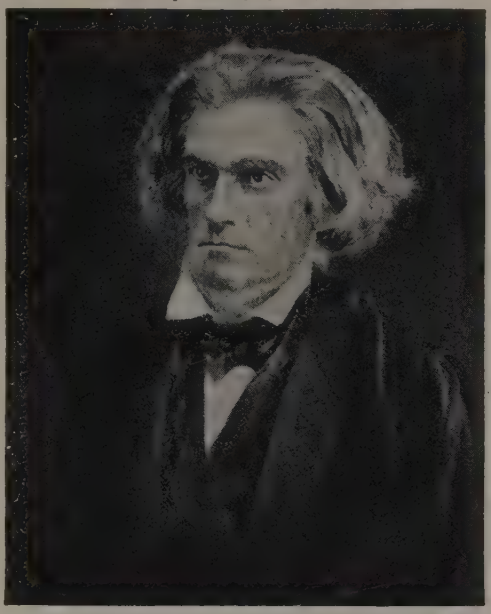
The Adamses and the Nation

Lacking the qualities that win popularity, they have not always been rewarded as they deserved; but no Adams has ever surrendered his principles to secure his personal advantage. In this New England family, Puritanism, with its submission to discipline and its strong sense of duty, has made us its best contribution.

It was at the knees of his mother —Abigail Adams—that the nine-year-old boy heard of the signing of the Declaration of Independence. Jefferson wrote the document, but it was John Adams who, by three days of argument, whipped the courage of the faint-hearted up to the point

of adopting resolutions that made every signer a traitor to King George. Men said that John Adams had "the clearest head and stoutest heart of any man in the Continental Congress." In constant correspondence with his brave, wise and devoted wife, he often said that he took "two clear heads and stout hearts" to the doing of every patriotic duty.

Calhoun, Student and Orator



Although Calhoun was by disposition and training a student, and "would have felt more at home among the philosophical gentlemen in Independence Hall than in the boisterous and rancorous days in which he found himself," he was, "of all the defenders of slavery, the most brilliant and convincing."

The son, John Quincy, was graduated from Harvard in the same year that Washington was elected president. Three years before his father had been appointed the first United States Minister to Great Britain. Learning under him the complicated business of diplomacy, the son soon became "the ablest diplomat in the American service," and was appointed successively to Holland, Portugal and Germany.

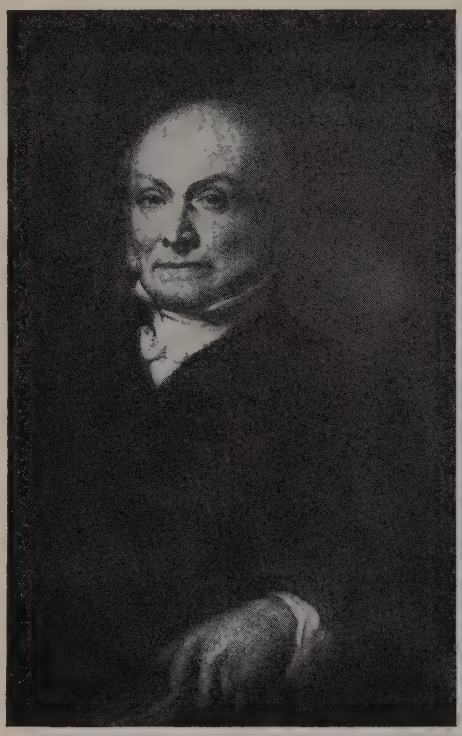
John Quincy Adams

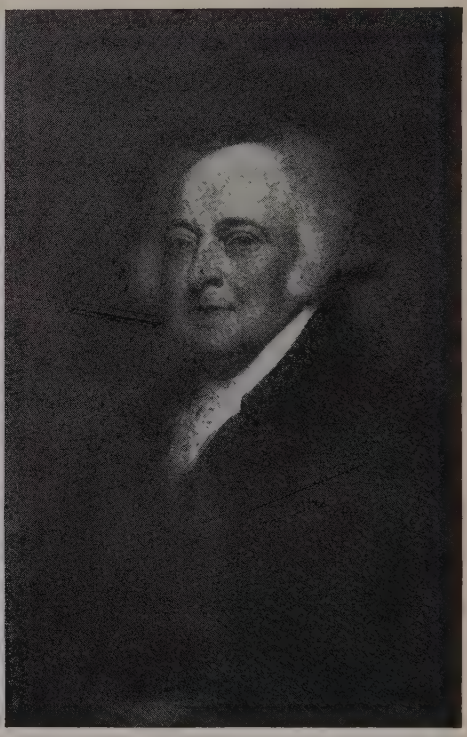
John Adams had been a moderate Federalist and so belonged to the party of Hamilton. The son was at first of the same political faith. With Jefferson's election he was recalled. He came home to fill the chair of rhetoric in Harvard, and to watch the Federalist Party die. For a time (1803-1808) he was United States Senator from Massachusetts, and strongly supported Jefferson's measures against the views of his own state. He became leader of an energetic New England wing of the Democracy that could not be ignored. President Madison sent him to the Court of St. Petersburg, and then to London. When next he came home it was to fill the office of Secretary of State under President Monroe. There was no other man in the country of Adams' ability; and he had had twenty years' experience in the foreign service.

While he was Secretary of State the "Monroe Doctrine" was declared. You remember that the policy of making "no entangling alliance" originated with Washington and Hamilton. It is Federalist in principle; but the Democrats saw the wisdom of it, and Monroe and John Quincy Adams enlarged it to the point of refusing to tolerate foreign interference in America.

Many early Federalist principles began, about that time, to find new and vigorous support. The War of 1812 had imperiled the country and developed a sentiment of national patriotism. The people responded

The Two Presidents the Adams Family Gave Us





The Adams family is the most famous in the political history of our country. These portraits of the two who served in the presidency, are by G. P. A. Healy. That of John Adams, at the right, is a copy of a portrait painted by Stuart. Both belong to the Ladies' Mt. Vernon Association, but are in the Corcoran Art Gallery in Washington. Of John Adams it was said that he had "the clearest head and firmest heart of any man in congress." You can see in their faces firmness, mental balance, and fearlessness. The portrait on the left is that of John Quincy Adams.

to the appeal to use goods "made in America," even if they cost more, and the first protective tariff law was passed in 1816. It was as a high-tariff, *National* Democrat that Adams was elected to the presidency in 1824. By 1830 the time was ripe for the formation of the Whig Party, and the revival of Hamilton's principles. During the last eighteen years of his life Adams was one of the leaders in Congress, with Whig leanings.

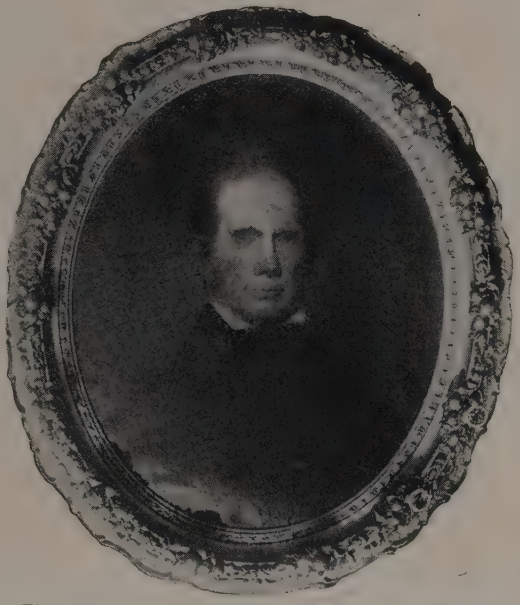
In 1833 Great Britain abolished slavery throughout the Empire, and a moral wave against the institution swept over western Europe and America. Abolitionism, in this country, spread from Puritan New England. Talk of secession, in that early day, was not all on one side. It was the ideal of many abolitionists to let the southern states depart in peace, and to form a free northern republic. The violent opinions and uncompromising attitudes of some abolitionists and Calhoun were equally disruptive.

His Denunciation of Slavery

Adams, while not an abolitionist, upheld the right to petition Congress against slavery, and fought a long and successful fight against Southern attempts to enforce "gag" measures. Without close party connections, this "old man eloquent" thus

rounded out his long life of patriotic usefulness, dying in 1848 of a stroke of apoplexy received on the floor of the House. His unflinching resistance to pro-slavery dictation no doubt stimulated Free Soil emigration into Kansas and Nebraska after Adams' death. Never popular, he won his way and kept his very real influence in public affairs by sheer ability and force. Harsh and narrow in his sympathies, he was honest and patriotic, and everyone granted him the "clear head and stout heart" of his father.

Henry Clay in His Prime



This portrait of Henry Clay hangs on the wall in the home of one of his descendants, Major C. D. Clay of Lexington, Ky., who kindly permitted a photograph to be taken of it to illustrate the story of our Golden Age of Oratory. It shows Clay at the zenith of his powers.

Before Washington finished his second term, or the first building had risen on the site of the new National Capital on the Potomac, a young law student of Richmond, Virginia, emigrated to Lexington, Kentucky. Going by sailing vessel to Philadelphia, he crossed the mountains on horseback. From Pittsburgh, a little settlement around an old Indian fort, he floated down the Ohio on a flatboat. It was a quarter of a century before the Cumberland Road was opened from Washington to Wheeling, Virginia, and a Congressman from the West could travel in comfort by steamboat and stagecoach.

The Young Law Student

Kentucky, however, had been admitted as a state in 1792. Louisville, at the falls of the Ohio, was a busy, if rude, little town; and the tiny capital in the Blue Grass region had its white-pillared statehouse, and its good society of professional men and wealthy planters, when Henry Clay hung out his modest shingle as an attorney-at-law.

The son of a poor Baptist minister of North Carolina, orphaned in childhood, he was imperfectly self-educated, according to the classic standard of the colleges of the day. But he was an ambitious and lifelong student. And he had an uncommon mind, an engaging personality, charming manners, and such an amazing gift for oratory that Kentucky, and then the Northwest, were soon at his feet. By 1800, at the age of twenty-three, he had started on a brilliant public career of half a century.

An Orator at Twenty-Three

Three years later he dazzled Washington with his speeches in the Senate, to which he was appointed to fill a temporary vacancy. And in

1811, on the day that he first took his seat in the House of Representatives, he was elected Speaker. In that office, which, in power, is second only to the presidency, he remained for sixteen years, except for one term, when he declined election. He served as Secretary of State to John Quincy Adams, and narrowly failed of election to the presidency in 1824, 1832, and 1844. During the last eighteen years of his life he represented Kentucky in the Senate.

The Home of Henry Clay

Here we are looking into the spacious grounds of the home of Henry Clay at Lexington, Ky. Lexington is in the famous blue-grass region and is noted for the beauty and fertility of the surrounding country. The grounds of Clay's home are filled with magnificent specimens of all the great variety of trees that grow in that region. The trees most conspicuous in the picture are oaks, as you can see from the character of the leaves and the rugged angular outlines of the limbs and branches.

Clay was the greatest party chief the country has produced, and the most popular orator. For fifty years he swayed applauding audiences to his mood. His style of oratory flowery, his appeal emotional, he moved men to laughter or tears, or to sweet reasonableness. He softened the hearts of men toward their enemies; drowned opposition under floods of eloquence, and stilled every storm with the music of his voice of persuasion. With hosts of friends and ardent admirers in all parties, Henry Clay had practically no enemies.

The Character of Henry Clay

Now, no man, however brilliant his gifts, could win such a place of general esteem and power, hold it so long, nor keep his enduring fame, unless he had solid qualities. What did Henry Clay stand for? What was his contribution to the problems of his time? He began his public life as a Democrat, but, as you know, there was for many years only the one political party in the country. This was divided into four factions; and Clay headed his own. The War of 1812 developed an ardent national patriotism in the West, and both Jackson and Clay were as staunch for the Union as Webster. But Kentucky differed with Ten-

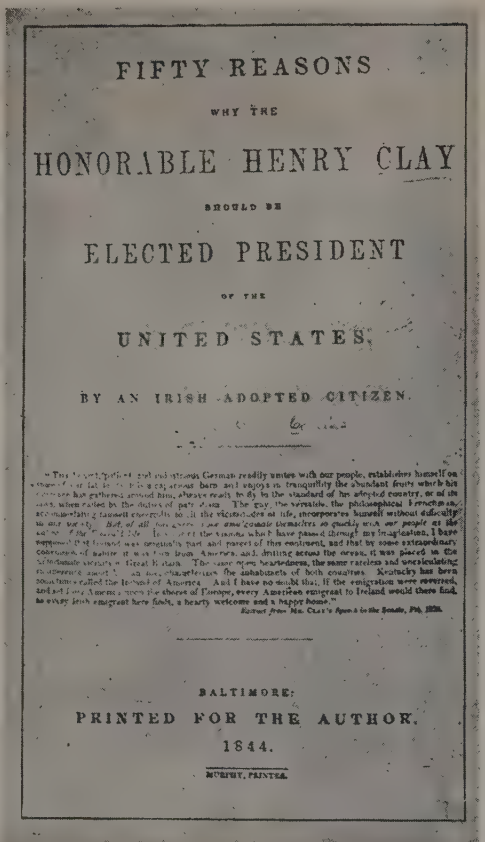
A Henry Clay Banner

This is one of the banners carried in the political campaign of 1844 when Henry Clay ran for the presidency. Frederick T. Frelinghuysen was a candidate for the vice-presidency. Frelinghuysen was an eminent lawyer and was chancellor of the University of New York from 1839 to 1850, and president of Rutger's College from 1850 to 1862. You see the great orator and statesman was affectionately known as "Harry Clay" just as Lincoln was spoken of as "Abe" Lincoln. Notice how many stars there were in the flag at that time. Could you name the states that made up the United States then?

nessee. It was more like Ohio and Indiana. It made hemp rope at an early date, while Ohio grew wool for the factories of New England. So Clay was in favor of a protective tariff.

You must remember that men's opinions are influenced by the needs and problems of the people around them. Had Clay represented some small, well developed seaboard state, he would probably never have appeared as the champion of internal improvements at the expense of the federal government. But living in the New West, with its poor, struggling pioneers, and its enormous stretches of wilderness, through which farm products could not be sent to market, nor needed goods returned, Clay thought a rich country should come to the rescue. In his time the great National Road was opened across Ohio, Indiana and Illinois to the Mississippi. Canals were cut, the naviga-

The "Fifty Reasons Why"



FIFTY REASONS

WHY THE

HONORABLE HENRY CLAY

SHOULD BE

ELECTED PRESIDENT

OF THE

UNITED STATES.

BY AN IRISH ADOPTED CITIZEN.

BALTIMORE:

PRINTED FOR THE AUTHOR.

1844.

TITLE-PAGE OF A CAMPAIGN PAMPHLET

This is the title page of one of the pamphlets circulated in the Clay campaign, and as you can see, gives fifty reasons why he should be elected President. It is by "An Irish Adopted Citizen," and as we can see by the extract from one of Mr. Clay's speeches lays particular stress upon his tribute to the character of the Irish and how they have helped to make America. Among other things he says, "Of all foreigners, none amalgamate themselves so quickly with our people as the natives of the Emerald Isle."

tion of rivers improved in the days of steamboating, and the earliest railroads were assisted by free rights of way and grants of public land. With a statesman-like vision, Clay made possible the rapid settlement and prosperous development of Kentucky and the Northwest.

Why He Was the Great Pacificator

This work was federalistic in principle, and all of Clay's natural leanings were toward the theories of Hamilton. After being in public life for thirty years, and representing the interests of only one section of the country, he found his true political home on the organization of the Whig Party, with its comprehensive national policies. But he was a different type of Whig from Adams or Webster. Living on the western border of the free and slave states, where violent opinions were not held on the tariff or slavery questions, he was noted for his tolerance. For thirty years he stood between the warring factions and parties of North and South. With a rare understanding and sympathy for both sides, he used his influence and powers of persuasion in the interests of mutual concessions and peace. He was the author of the Missouri Compromise of 1820. After the passage of Jackson's Force Bill he persuaded the New England Whigs to consent to a gradual lowering of the tariff for the relief and pacification of the southern states. And before he died, in 1852, he made a last effort to settle the slavery question by another compromise.

Of course he settled nothing permanently, because it could not be done by compromise. But he softened many asperities, sweetened the bitter spirit of his time, and helped delay an inevitable conflict until the country was better prepared to meet the shock of civil war. And, he, as well as Webster and Jackson, played an important part in educating the next generation in national patriotism. The honor of which he was proudest was his popular title, "The Great Pacificator."

The Story of Daniel Webster

His Delicate Childhood

In reading the stories of great men we learn the potential value of all life. Many whom the world could ill have spared were frail in childhood. Daniel Webster, whose name is spoken with reverence and awe today, for his inspired patriotism and genius for oratory, was so delicate in infancy that he was kept alive only by the intelligent devotion of a Puritan mother. And as he grew up on a poor, stony farm, near Salisbury, New Hampshire, he was the only one of a large pioneer family, who was exempt from hard labor.

Even as a child his head was too heavy for his slight body. It was covered with a mop of thick, black hair. With his dark eyes glowing in his swarthy face, under a bulging forehead and bushy eyebrows, he early got his nickname of "Black Dan." His mother, in teaching him what she knew, discovered that he had a remarkable mind. At fifteen he had mastered all that was to be learned in a local academy. Then the father, mother, brothers and sisters, gathered around the rude fireplace for family prayers, decided that, no matter at what cost of toil and privation to the others, little Black Dan must go to college.

The sensitive boy burst into tears at this proof of confidence and devotion. And he repaid it in kind.

Webster Under the Big Elm Tree

Although New England farms were never rich, they have produced some of the finest crops in the history of the country. These crops were great men. Webster was one of them. He grew up on a stony farm near Salisbury, N. H., and he never got over his love for country life. Here you see him in one of the big soft hats he loved to wear on his vacations, sitting under an elm tree on his country estate at Mansfield, Mass., which he bought after he became a famous man. He is evidently chatting with someone and at his feet are probably some state papers which are the subject of their conversation.

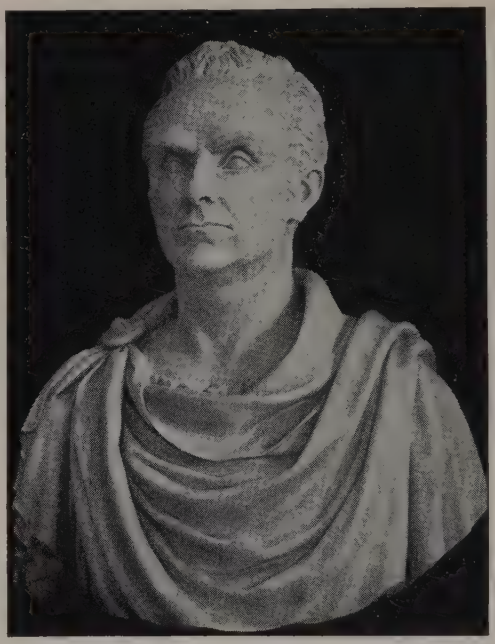
You wouldn't think to look at him, that he was once a delicate, frail child, would you? He was so delicate that he could not help much with the farm work, but he afterwards grew into the magnificent specimen of physical manhood we see here under the tree. His mother was his first and best teacher. She taught him all she knew and insisted on his going, first to the local academy, and afterward to college. All the family agreed to this, and when they told little Dan of their decision, he burst into tears to think how much they cared for him and believed in him. After he graduated from Dartmouth, he himself taught in an academy to earn money to send his brother Ezekiel to college. Then later when he had built up a law practice in one town, he turned it over to Ezekiel and started over in another town.

After his graduation from Dartmouth, he sent a brother through college. He cared for his father and mother until their death. He built up a law practice in Boston and gave it to a brother, beginning again in Portsmouth. In all history there is not a finer example of family love and loyalty than that of the Websters'.

In Daniel Webster's great heart and mind, this love and loyalty grew until they embraced his country. At the age of eighteen he delivered a Fourth of July oration, in which he made an impassioned appeal for national patriotism. This was in 1800, long before the people had outgrown their strong sense of the separate colonial origins of the states. Until 1816 Dartmouth College cherished and used the charter granted to it by King George, in 1760.

Webster served a term in Congress in 1812, and again in 1823, and he lost no opportunity to put his broad conception of patriotism before the country. By three speeches —at the celebration of the second centennial of the landing on Plymouth Rock, in 1820; at the dedication of Bunker Hill Monument in 1825; and by his eulogies of Jefferson and Adams in 1826—he made his views known throughout the country, and won enduring fame as an orator. But his great opportunity did not come until January, 1830, when, at forty-eight years of age, he was one of the United States senators from Massachusetts.

If Webster Had Been a Cicero



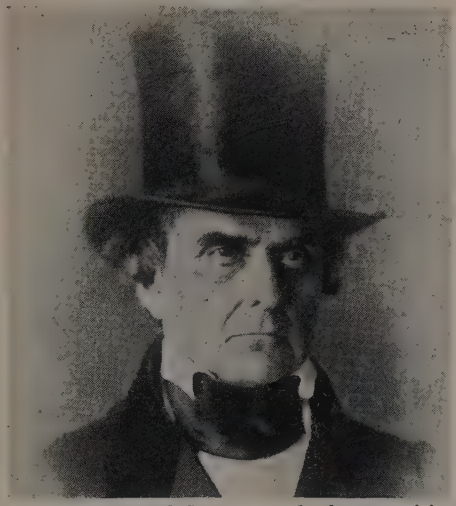
If Webster had lived in the days of the Romans, the Roman Senate instead of the United States Senate, would have echoed the tones of his wonderful voice with its "range and melody of a chime of bells," and he would have worn a toga as he does here and gone about everywhere without a hat, as the Romans did. This is a portrait bust of him in marble by the famous American sculptor, Hiram Powers. Powers, like Webster, was a New England country boy and studied art in Italy; so no one could have been better fitted to "translate" the great American orator into Latin. What magnificent eyes and brows; and that powerful neck, and chin and jaw, and the "mastiff mouth" as Carlyle called it. Webster, by the way, was a fine Latin scholar and attributed his success as an orator to his study of the Greek and Latin poets and orators. From his college days on he used to read them over and over, and could recite practically the whole of Virgil's Aeneid.

The Famous Reply to Hayne

Then it was that, in his "Reply to Hayne" he made a memorable speech, and became the greatest figure in public life in America. Senator Hayne, of South Carolina, who was Calhoun's chief disciple, had declared that the federal government was only a loose confederation, erected by the sovereign states, and that any state had the right to refuse to obey a law of Congress, or even to secede from the Union.

Webster rose to packed galleries,

And Such Eyes!



As a member of Congress and when practicing at the bar, Webster wore this tall silk hat. We can realize as we look into his face why he was called "Black Dan." His face was swarthy, and his dark eyes so remarkable that they at once attracted attention. When he visited London in 1839, his whole appearance and bearing was so striking that even in that crowded city, where you have to be a very great man indeed for anyone to pay any attention to you, the people on the streets everywhere used to stop and look at him whenever he passed along.

Thomas Carlyle who met him in London, drew the following pen picture of him in a letter to Emerson:

"Not many days ago I saw at breakfast the notablest of your notabilities, Daniel Webster. He is a magnificent specimen; the tanned complexion, the crag-like face; the dull, black eyes under the precipice of brows, like dull smouldering furnaces, needing only to be blown."

"looking like Judgment Day." Grave and dignified, he had the noblest head America has produced.

Character of Webster's Oratory

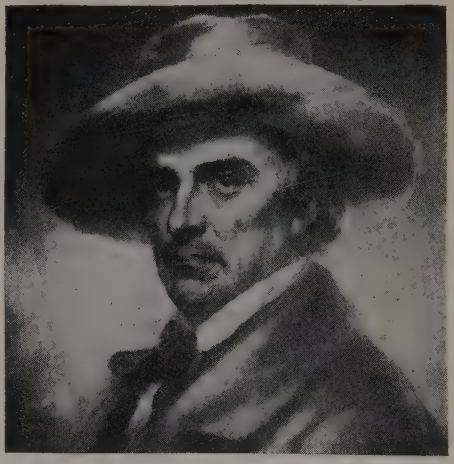
His oratory was not as polished as Calhoun's, nor as graceful and persuasive as Clay's. There was something in him of his granite hills, and the spirit of duty and sacrifice of his Puritan ancestry. His logic was unanswerable, his learning profound, but his choice of words was so simple that the unlettered could follow him. He made no appeal to the emotions. His argument rested on moral principles and impassioned patriotism. And his voice had the range, melody and solemn beauty of a chime of church bells on a Sabbath morning.

Our government was then forty-two years old, and this was the first defense of the federal Constitution heard since the death of Hamilton. Webster's speech lifted the whole question of "States' Rights versus Federal Authority," from the level of political theory to the high plane of national ethics. We had a charge to keep—our sacred republican institutions. He declared that nullification was not only dangerous but treasonable. It could lead to nothing but disruption and civil war, and to the betrayal and destruction of all that our revolutionary fathers had fought and died for, and left to us in trust for future generations.

For twenty-two years after that Webster was a colossal figure. He stood apart and above party politics. To those he was more or less indifferent. While he was one of the organizers of the Whig Party, be-

Devotion to the Union

Webster in the Big Hat Again

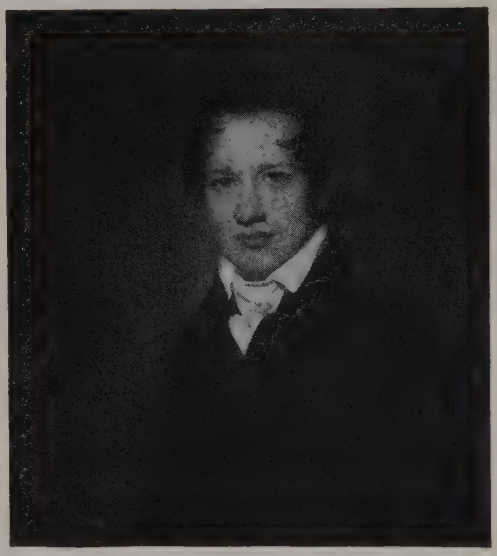


This is another picture of Webster in his big soft hat. Mrs. M. L. Joy of Boston, who loaned Pictured Knowledge this portrait for reproduction, says that it was one of the latest portraits painted of him and adorned the walls of his country home at Mansfield. "The hat which he wears," she says, "was one in daily use when he was in the country."

cause of its federalistic principles, he believed, with Jefferson, in free trade. He supported the protective tariff only because it had been established, and could not easily be abandoned without ruining American industries. Opposed to the extension of slavery, he yet joined Clay in his compromises. And he joined Jackson in putting through the Force Bill. In truth, he hated abolitionist and nullifier alike, as did Jackson, and he fought every measure and every opinion which tended to divide the country.

His one passion and political doctrine was love and loyalty to his country. He made a profound impression on the people of all classes and sections. Extracts from his patriotic speeches were used in school readers. Little boys declaimed them in log schoolhouses on Friday afternoons. Lincoln, at twenty-one, read the "Reply to Hayne" in a Louisville newspaper in the little settlement at Salem, Illinois. Long afterwards he said "Patrick Henry was the greatest American orator, Clay the most persuasive, Calhoun the most brilliant, but Webster's Reply to Hayne was the greatest single speech delivered since Demosthenes' 'On the Crown.'"

The "Other Man" in the Great Debate



Next to delivering one of the greatest speeches in the history of oratory, it is a great distinction to have been the cause of such a speech. The young man with the pleasant smile who is looking at you here has this distinction; for this is Robert Y. Hayne in reply to whom Webster delivered the greatest of his public speeches in defense of the Union in opposition to the doctrine of states' rights, which Hayne supported.

But you may be sure that Hayne himself was an orator of rare ability, or what he said could not have furnished the occasion for such a reply from such a man as Webster. As a school boy he did not show much talent at first, but he made a study of oratory and, after he entered public life, soon distinguished himself as one of the most brilliant speakers among the younger senators.

He had a fine personal appearance and a winning manner. His method of speaking was quite different from Webster's. While Webster's manner was deliberate and ponderous, Hayne "dashed into debate like Mameluke Cavalry upon a charge." He had a gallant air about him which won admiration. After the close of Webster's speech he was the first to approach him with extended hand and the warmest expressions of admiration.

Our portrait of him was supplied by Mrs. Robert Y. Hayne, the widow of the orator's grandson.

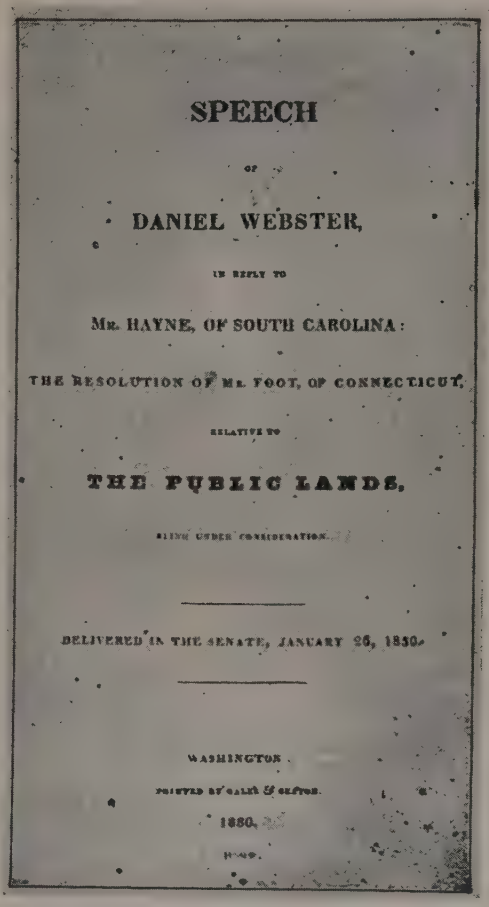
Grief and alarm were felt throughout the country when Webster died in October, 1852. How was distracted America to live without him? Clay had died in June; Calhoun two years before; Adams in 1848; Jackson in 1845. It had been an age of giants. Now they were all gone. Both parties were left without able or responsible leaders. The Democrats got out of hand and passed the Kansas-Nebraska Bill, which repealed the Missouri Compromise. The Whigs went to pieces.

The Republican Party was organized in 1856, and soon attracted to itself all the federalistic and anti-slavery sentiment in the country—the Whigs, Know-Nothings, Free

Webster's Greatest Speech in Pamphlet Form

Soilers and Abolitionists. Lincoln was one of the organizers of the new party in Illinois. Aroused by the peril to the Union, this unknown lawyer, in a small western capital, developed a remarkable gift for oratory, and qualities of leadership that swept the Republicans to victory in 1860.

Then the storm of civil war, that had been gathering for a quarter of a century, broke. It was Lincoln's task, begun by Webster, Clay, and Jackson, to preserve the Union.



SPEECH

OF

DANIEL WEBSTER,

IN REPLY TO

MR. HAYNE, OF SOUTH CAROLINA:

THE RESOLUTION OF MR. FOOT, OF CONNECTICUT,

RELATIVE TO

THE PUBLIC LANDS,

NOW UNDER CONSIDERATION.

DELIVERED IN THE SENATE, JANUARY 26, 1830.

WASHINGTON:

PRINTED BY GALES & SEATON.

1830.

It was not only the custom in the golden age of American oratory for the newspapers to print speeches of eminent public men in full, but they were reprinted in convenient pamphlet form, so that men could carry them about in their pockets and read and reread them and argue about them with their neighbors, and many of these speeches were preserved in this form and handed down as precious possessions. This copy of Webster's speech in reply to Hayne is in the collections of historic documents in the Smithsonian Institution at Washington. Wouldn't you like to have a copy of it!

The Blue and the Gray

By the flow of the inland river,
Whence the fleets of iron have fled,
Where the blades of the grave-grass quiver,
Asleep are the ranks of the dead:
Under the sod and the dew,
Waiting the judgment-day;
Under the one, the Blue,
Under the other, the Gray.

These in the robings of glory,
Those in the gloom of defeat,
All with the battle-blood gory,
In the dusk of eternity meet:
Under the sod and the dew,
Waiting the judgment-day;
Under the laurel, the Blue,
Under the willow, the Gray.

From the silence of sorrowful hours
The desolate mourners go,
Lovingly laden with flowers
Alike for the friend and the foe;
Under the sod and the dew,
Waiting the judgment-day;
Under the roses, the Blue,
Under the lilies, the Gray.

So with an equal splendour,
The morning sun-rays fall,
With a touch impartially tender,
On the blossoms blooming for all:
Under the sod and the dew,
Waiting the judgment-day;
Broidered with gold, the Blue,
Mellowed with gold, the Gray.

So, when the summer calleth,
On forest and field of grain,
With an equal murmur falleth
The cooling drip of the rain:
Under the sod and the dew,
Waiting the judgment-day;
Wet with the rain, the Blue,
Wet with the rain, the Gray.

Sadly, but not with upbraiding,
The generous deed was done,
In the storm of the years that are fading
No braver battle was won:
Under the sod and the dew,
Waiting the judgment-day;
Under the blossoms, the Blue,
Under the garlands, the Gray.

No more shall the war cry sever,
Or the winding rivers be red;
They banish our anger forever
When they laurel the graves of our dead!
Under the sod and the dew,
Waiting the judgment-day;
Love and tears for the Blue,
Tears and love for the Gray.

FRANCIS MILES FINCH

The Story of Abraham Lincoln

The Crumbling Cabin in the Marble Shrine

This is a scene on the Lincoln farm at Hodgensville, Ky., when President Wilson, on behalf of the nation, accepted the memorial temple which encloses all that remains of the little cabin in which Lincoln was born. Let us imagine that we are among the twenty thousand people present and listening to this speech. Among other things this is what we hear:

"How eloquent is this little house within this shrine, of the vigor of democracy! There is nowhere in the land any home so humble that it may not contain the power of mind, and heart, and conscience to which nations yield and history submits its processes. Every door is open in every hamlet and countryside * * * for the ruler to emerge when he will and claim his leadership in the free life.

* * *

"This little hut was the cradle of one of the great sons of mankind. * * * His heart seemed to comprehend all mankind in its catholic and benignant sympathy. * * * The mind that sat enthroned behind those brooding, melancholy eyes * * * comprehended what it had never seen, and understood the language of affairs with the ready ease of one to the manner born; a nature that seemed in its varied richness to be the familiar of men of every way of life.

* * *

"We are not worthy to stand here unless we ourselves be, in deed and in truth, real democrats and servants of mankind, ready to give our very lives for the freedom, and justice, and spiritual exaltation of the great nation which shelters and nourishes us."

WITHOUT any doubt, the birth of Lincoln, of poor, illiterate parents, in the backwoods of Kentucky, was the most important event in America, after the Declaration of Independence and the adoption of the Constitution. Our country was founded in the new faith that the common people possessed the wisdom, virtue and unselfish patriot-

The Savior of Democracy

ism necessary for self-government. Lincoln justified that faith. From the humblest origin and the scantiest opportunities, he appeared in a national crisis, not only to save the Union, but to prevent, for all liberty-loving people, the failure of democracy.

A Visit to Lincoln's Birthplace

Let us take a little journey to the farm in Hardin County, where he was born on February 12, 1809. You leave the train at the quiet village of Hodgensville, and drive out over a pleasant country road. The farm is, today, part of a landscape of pastures, groves and cornfields. Nearby is the shady creek where Lincoln learned to swim and fish. And there are still lichen-crusted, briar-grown remnants of the rail fences that enclosed the little clearings of more than a century ago. In such a rustic scene, it is strange to come upon a temple of glistening white marble, its flight of broad steps leading up to a lovely line of classic pillars. The visitor instinctively takes off his hat as he steps within the historic shrine that was built by the Lincoln Farm Association over the decaying log cabin, in which our great president was born.

The Home of the Lincolns

The top of its stick and clay chimney crumbled and fell long ago. Its roof of weather-worn clapboards and poles long since ceased to keep out the rain. But even when new, it could have furnished little better shelter than an Indian lodge. The floor was of earth. A deer skin curtain served as its first door. The bed was of poles, laced with deer hide, and supported by holes bored in the logs. There was not even an iron crane to hang a kettle over the fire. Even among poor pioneers the Lincolns were poorer than others. The food of the family was game, fish, wild berries, honey from bee trees, and the little corn that could be grown between the stumps, pounded into hominy. Little Abe wore buckskin clothing. When very young he had to ride ten and twenty miles through the woods, to have corn ground at the nearest water-mill. And he had to carry a gun to defend himself from the wolves, black bears, lynxes and wild cats that infested the woods.

Death of Lincoln's Mother

Southern Indiana, to which the family moved in 1816, was equally wild. The new cabin was scarcely up before the young mother—Nancy Hanks Lincoln—died of milk sickness, for the one cow had eaten poisonous weeds in the woods. The nine-year-old boy helped his father whipsaw boards and whittle pegs for the rough coffin in which they laid her away by a deer path in the forest.

The piteous death of his mother, for lack of a doctor or the simplest remedies, was a life-long grief to Lincoln. In an unlettered family, and with no schooling, Nancy Hanks had, in some way, learned to read and write. She taught her son all she knew and told him stories of Washington, and of the brave grandfather for whom she had named him, who had come out to Kentucky with Daniel Boone and fought Indians. She often urged him: "You l'arn all you kin, Abe an' be somebody."

A Mother's Inspiration

So, with the nearest log schoolhouse nearly five miles distant, and teachers little better than wandering

vagabonds, Lincoln taught himself from Webster's spelling book and the Bible. He earned a copy of Weems's Life of Washington by cutting two cords of wood. His cousin, Dennis Hanks, ten years older than himself, got him The Arabian Nights. His kind and capable stepmother helped and encouraged him. He often read aloud to her, as he lay at length, his book between his elbows, before the fire. He borrowed and read every book within twenty miles of his home, even the dry statutes of Indiana. And at the country store and mill at Gentryville, now Lincoln City, he read the speeches of Henry Clay, in the small newspapers of Cincinnati and Louisville.

How Lincoln Taught Himself

© *Horace K. Turner Co. Lincoln's Boyhood, by Eastman Johnson.*

"He borrowed and read every book within twenty miles of his home. * * * By the time he was twenty-one, he had done an astonishing amount of reading in his scant leisure, after nightfall and at noon when he rested the plow horse."

By the time he was twenty-one, Lincoln had done an astonishing amount of reading in his scant leisure, after nightfall, and at noon when he rested the plow horse and munched his dry corn dodger under a tree. And it was not only from books that he learned. He made time to know and to love and serve his neighbors; to keep informed on events of the day, and to improve himself in every manly, useful way. He excelled at running, wrestling and all country sports. Growing up tall and strong, he was the champion tree-chopper, rail-splitter and log-roller of the countryside. He broke up crowds of rowdy young men and won their friendship. He protected women, children and dumb animals; and he soundly thrashed bullies who could be persuaded to good behavior in no other way. He lost no chance to hear a good sermon, stump speech or court-room argument; or to talk with a judge, lawyer or preacher traveling the circuit. It was his instinct to sit at the feet of superior men. He committed some of Henry Clay's speeches to memory; and working his way down to New Orleans as a deck-hand on a flatboat, he saw things that set him to pondering on public questions that the wisest men then in the country were unable to solve.

An All-around Education

He Starts Out Into the World

For twenty-one years he gave cheerful obedience, affection and unstinted service to a lovable but impractical father who "never could

seem to get ahead." For good measure he helped the family move to Illinois, and clear and fence a field for corn. Thirty years later John Hanks set the State Republican Convention wild by carrying two rails he had split into the hall. But little he thought of the end of the journey, when he tied his homespun shirts and knitted socks in a bandana handkerchief and set out afoot along the banks of the Sangamon River. His fortune did not concern him. He sought only knowledge, and a wider field of usefulness and service to humanity.

In the thriving little settlement of three hundred people of New Salem, where he found a home and friends for the next six years, there were books, educated people, and a schoolmaster to teach him grammar. He had things to say, already, and his first necessity was to learn how to express himself in speech and writing. Here he read and was deeply stirred by Webster's "Reply to Hayne." As the village postmaster, carrying mail to distant farms, if he had an errand that way, he read every newspaper that circulated in the region. Fighting Indians in the Black Hawk War, civilizing the rowdy Clary's Grove boys, who terrorized peaceable settlers, clerking, failing as a storekeeper, serving the town in the state legislature, and winning hosts of friends by his social gifts, Lincoln lived the precarious life of a student, while, with borrowed books, he educated himself for the bar. It is not to be supposed that he could not have made a better living, with his strength and skill and tireless industry, and with the personal popularity and public respect that are, everywhere, valuable assets. He won the sort of success that he cared most about.

Further Education and Training

Beginning the Practice of Law

As poor in pocket as when he entered the town, Lincoln borrowed a horse to ride away to Springfield to begin the practice of law, at the age of twenty-eight. He remained in the state legislature until 1842, and secured the removal of the capital from Vandalia. In the forties he served one term in Congress; but there he made no attempt to distinguish himself. He used the opportunity to listen to Webster, Clay, and Calhoun, and he went home to devote ten years to the routine practice of law.

Long afterwards, almost every lawyer and judge who traveled the circuit with Lincoln filled a book with stories about him. They told how people crowded into the courtroom whenever he was to address a jury. He captured audiences and won verdicts with his homely wit, kindly humor, tender pathos, apt anecdotes that were like the parables of the Bible, and by his sincerity and shrewd common sense. He won the nickname of "Honest Abe" because he would defend no man unless he believed him to be innocent. He did not dazzle people at all. Any child could understand him. College-bred associates who fell under his spell, marveled at his power, for, according to the classic standards of the day, he had no learning. His very simplicity caused him to be long underestimated. Not until 1856, when he was forty-seven was he regarded as a profound thinker, a gifted political leader and an orator of the first rank.

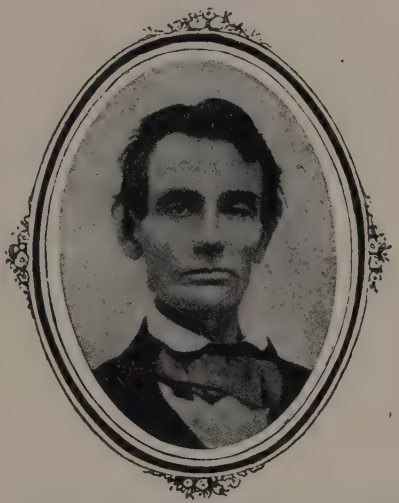
How He Won His Cases

Entry Into National Politics

Lincoln had been out of politics for ten years, when the northern states were alarmed by a threatened spread of slavery. By 1852 all the old leaders of both parties were dead. The Whigs went to pieces, and the distracted northern states were divided among several small, ineffective parties—the Whigs, Abolitionists, Free Soilers, Know Nothings, and the Democrats who were united with the solidly Democratic South. It was a northern Democrat, Senator Stephen A. Douglas, of Illinois, who was the author of the Kansas-Nebraska Bill which repealed Clay's old Missouri Compromise. Free-soil and pro-slavery colonists immediately swarmed into Kansas Territory to fight for possession of the next new state. Then the Dred Scott Decision of the United States Supreme Court permitted masters to take their slaves into any free state, and to hold them there.

In this crisis Lincoln re-entered public life. As his first concern was to oppose the re-election of Senator Douglas, he returned to the state legislature. He joined the movement to bring all the federalistic and anti-slavery sentiment in the state together, and to organize the Republican Party in Illinois. In his speech before the Republican State Convention he made an observation that set the nation to thinking as it had not thought on any question since Patrick Henry: "A house divided against itself cannot stand. I believe this nation cannot remain permanently half slave and half free."

A Face That Speaks of History



If ever the history of a brave life was written in a human face, it was in that of Abraham Lincoln, but in none of his portraits can we read so clearly and definitely—letter by letter, so to speak—what the face has to say, as in what is known as the "Macomb" portrait which is here reproduced. If we contrast it with one of his earlier pictures, we will see what an air of determination has here come over his face. This portrait was taken when he had decided to pursue a course in his debates with Douglas, against which all his friends and political associates advised him, and which he knew would probably cost him the election to the United States Senate for which he was running. It was taken at Macomb, Ill., two days before one of the debates, and is now owned by Captain W. J. Franklin who loaned it to Pictured Knowledge for reproduction. It shows, as none of his other portraits do, the unbending determination of which he was capable when his conscience told him to take a certain course.

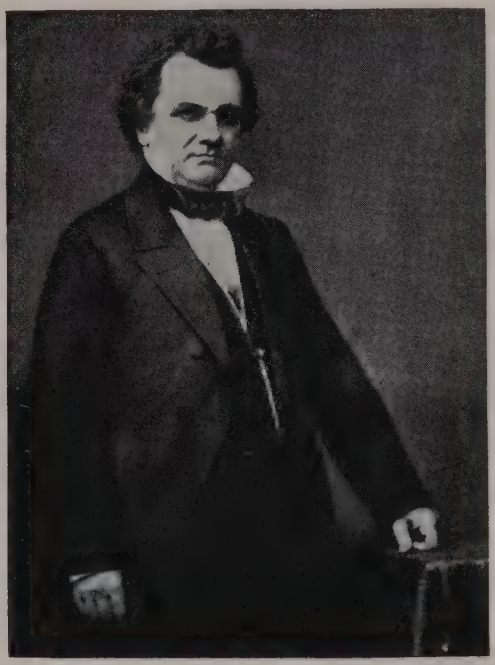
The Famous Douglas Debates

Lincoln was immediately put forward as the Republican choice for senator. His reply to a Chicago speech by Douglas led to a series of debates between the two that covered every congressional district in the state. The challenge attracted the attention of the country. Douglas was the "Little Giant," an orator of national fame and the probable Democratic candidate for the presidency in 1860. Outside of his own state Lincoln was unknown. Men rode and drove, and even walked, thirty miles to hear those speeches.

Eastern newspapers reported them. And people went home to say: "Douglas is the most eloquent speaker, but—Lincoln has the right of it."

That is the final test of oratory: to be convincing. Lincoln was so simple, so direct, that people who heard him were not carried away at the time, but it was astonishing how single sentences of his stuck in the public mind. He was unforgettable. He failed to win the senatorship, but he split the Democratic Party by admissions that he forced from Douglas. His fame was nationwide; and his name swept the National Republican Convention in Chicago, like a prairie fire and won the election of 1860.

"The Little Giant"



"Douglas was the 'Little Giant,' an orator of national fame and a probable democratic candidate for the Presidency in 1860." People who heard the Douglas debates said: "Douglas is the most eloquent speaker, but Lincoln has the right of it."

The contrast between the appearance of the two men was equally striking. While Lincoln was tall, Douglas was hardly five feet high. He was called "The Little Giant," not only because he had such a brilliant mind, but because he had a large head and a massive chest for his size.

School textbooks have too little room to explain Lincoln's political convictions. Born and brought up in the Ohio River Valley, when Henry Clay was the popular idol for a half century, he was a Whig of the Clay faction. He had also been profoundly influenced by President Jackson's vigorous handling of the nullification doctrine and talk of secession in the thirties. But most of all he was moved by Webster's twenty years' defense of the Federal Constitution, and eloquent pleas for national patriotism. His one fixed determination, on entering the White House, was to preserve the Union.

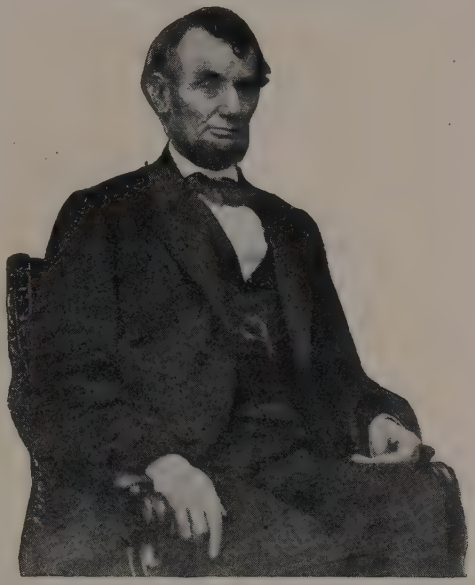
The Slavery Question and the Union

Although slavery shocked and saddened him, and he resisted its spread into the free states and territories, he was not an Abolitionist. Like Henry Clay, he understood the difficulty of changing the labor system upon which the agricultural industries of the southern states were based, and sympathized with them. He knew that there was a strong sentiment in the border states for the gradual emancipation of the slaves; and he thought that, as the states came to that frame of mind, the entire country should share the social and financial burden of freeing the black race.

In that time of heated feeling, Lincoln was the best friend the South could have had in the White

House. He would not have been hurried, for abolition sentiment was so far from dominating the Republican Party that it was not until 1863 that he was sure of support in issuing the Emancipation Proclamation. And he did not abolish slavery. He simply freed the slaves of states that were in rebellion, to weaken the Confederacy and prevent its recognition by England. In neutral border states and in states that had been conquered by Union armies, slavery was undisturbed, until it was abolished by amendment to the Constitution after the war ended.

How Lincoln Looked in '64



This picture of Lincoln is from a photograph taken in Washington early in 1864 by a Mr. Brady and hence is known as the Brady photograph. The rough appearance of the ear and a portion of the clothing is due to a defect in the negative. The American sculptor, Bartlett, commenting on Lincoln's appearance when seated, said: "Lincoln's dignity when sitting shows that the popular notion as to his ungainliness is exaggerated. He also stood well and, above all, in a natural and unassuming manner."

But, alarmed by Lincoln's large majority, misunderstanding and mistrusting him, and over-estimating the strength of abolition sentiment in the North, the southern states were convinced that an immediate attack was to be made upon slavery. Between November and March seven states seceded and set up the Confederate Government. The saddest man in the country, Lincoln went to Washington under guard to be inaugurated.

Then Came the War

Your history tells you all about the four years' war; its great campaigns and battles, its shifting fortunes, the conquest of the exhausted South, and Lincoln's official acts. So let us give you this little picture of the war's beginning, as it appeared in Chicago where, in the June before, Lincoln had been nominated in the barn-like Wigwam, to the booming of cannon, shrieking of whistles, and clamor of fire bells.

"Fort Sumter was bombarded on Saturday, April 13, 1861. Nothing could be done on Sunday. It was one of those cloudless days, warm as July. An azure sky was reflected in a sapphire lake. A gentle breeze stirred the folds of Old Glory, which floated from every gable. Church doors and pulpits were draped in the colors. Congregations sang America. Ministers prayed that the untried president might have wisdom and strength for his patriotic task. It was a day of grief, bewilderment and prayer. On Monday morning President Lincoln issued his call for volunteers. In just three weeks thirty-eight companies of boys in blue—among them Germans, Swedes, Poles, and a whole Irish Brigade under Colonel

Mulligan, marched from Chicago to Springfield." All over the North tramping regiments sang:

"We are coming Father Abraham
Three hundred thousand strong."

It was not, however, until the issue of the Emancipation Proclamation, January 1, 1863, that the country realized that it had a statesman comparable to Washington in the White House; nor until the following July that it had one of the greatest of heroes. In a speech of fewer than three hundred words (delivered at the dedication of the battlefield of Gettysburg as a national cemetery) Lincoln revealed the mind of a sage, the foresight of a prophet, the purpose of a historic reformer and the heart of a mother. In that, and in his second inaugural he gave us literary classics.

A Martyr for His Country

On April 15, 1865, four years and two days from the beginning of the war, and five days after the South laid down its arms, Lincoln suffered a martyr's death, dying "with malice toward none and charity for all." His task was not finished. The ruined South lost its best and wisest friend. A member of his cabinet who saw him breathe his last, spoke the thought of the world and the verdict of history: "Now he belongs to the ages."

"Honest Abe Is Dead"

One more little picture. You will not find it in your textbooks. It was drawn for the writer of this sketch by Dennis Hanks, Lincoln's cousin and earliest friend. He was ninety at the time, and our great president had been dead a quarter of a century. An uneducated cobbler of sixty-six, "a little

The Words That Freed the Slaves

On the opposite page is a reduced reproduction of one of the four pages of the first draft of what the London Spectator called, "the noblest political document known to history," the Emancipation Proclamation. It is all in the handwriting of Lincoln except two interlineations on another page by Secretary Seward, and the formal heading and ending which was written by the Chief Clerk of the State Department.

The original draft is dated September 22nd, 1862. On New Year's Day, 1863, as you see he expresses his intention of doing in the second paragraph of this reproduction, he issued the final Proclamation.

When you go to Washington some day you can see both the original draft and the final Proclamation which are kept among the precious original documents of the nation, and you will notice that the signature of the final Proclamation shows that the president's hand trembled a little. "Not," said Mr. Lincoln in speaking of it afterwards, "because of any uncertainty or hesitation on my part; but it was just after a public reception and three hours of hand-shaking is not calculated to improve a man's handwriting."

As the document lay unrolled before him, he took a pen, dipped it in ink, moved his hand to the place for signature, held it a moment and then without signing, laid the pen aside, and turning to the Secretary of State, Mr. Seward, said:

"I have been shaking hands since nine o'clock this morning and my right hand is almost paralyzed. If my name ever goes into history it will be for this act and my whole soul is in it. If my hand trembles when I sign the Proclamation, all who examine the document hereafter will say, 'he hesitated.'" He then turned to the table, took up the pen again and slowly and carefully signed his name.

That on the first day of January in the year of our Lord, one thousand eight hundred and sixty-three, all persons held as slaves within any state, or designated part of a state, the people whereof shall then be in rebellion against the United States shall be then, thenceforward, and forever free; and the executive govern-
ment of the United States, including the military and naval authority thereof, will, ~~during the con-~~
~~tinuance in office of the persons now chosen~~, re-
cognize, and maintain the freedom of
such persons, ~~and will not be a slave~~, and will
do no act or acts to repress such persons, or any
of them, in any efforts they may make for their
actual freedom.

That the executive will, on the first day of Jan-
uary aforesaid, by proclamation, designate the
states, and parts of states, if any, in which the
people thereof respectively, shall then be in re-
bellion against the United States; and the fact
that any state, or the people thereof shall, on
that day, be, in good faith represented in the
Congress of the United States, by members chosen
thereto, at elections wherein a majority of the

Lincoln and His Cabinet at the Signing of the Emancipation Proclamation

It was without consultation with, or the knowledge of, his cabinet that Lincoln prepared the original draft of the Proclamation, although the idea of emancipation had frequently been discussed. When he had written it out, he called a meeting of the cabinet and submitted it. To preserve in picture form the memory of this great event, F. B. Carpenter, the artist who painted this picture, spent six months with Mr. Lincoln at the White House, getting materials and information so that the picture should be as accurate as possible. In describing the circumstances of the meeting to the artist, Mr. Lincoln said that no suggestions were offered that he had not anticipated and settled in his own mind, until Secretary Seward suggested that the Proclamation should not be issued at that time because the war had been going against the Union armies. "His idea," said Mr. Lincoln, "was that it would be considered our last shriek on the retreat, and that it should be given to the country following some military success. It was an aspect of the case that I had entirely overlooked, and seeing the wisdom of it I put the Proclamation aside as you do a sketch for a picture. From time to time I added or changed a line, touching it up here and there, anxiously watching the progress of events." Finally came the battle of Antietam and on the first day of the year following, the Proclamation was issued.

The picture shows the meeting of the cabinet when the Proclamation was first submitted. The President sat near the head of the table. Facing him was the Secretary of State, Mr. Seward. Seated at his right is Mr. Stanton, Secretary of War, and between them is Mr. Chase, Secretary of the Treasury. On Mr. Lincoln's left in the order named are: Secretary Welles, of the Navy; Secretary Smith, of the Interior; Postmaster General Blair, and Attorney General Bates, the man with the folded arms.

The President is represented as holding in his hand the Proclamation, which he has just read, and listening to the important suggestion by Secretary Seward that it should not be issued until after a Union victory.

runt of an old man," as he described himself, he was pegging away at a broken shoe, in his shop in Charleston, Illinois, when a neighbor, white and shaken, ran in from the streets.

"Denny!" he cried, "Honest Abe's dead; shot dead!"

"Like the Earth Had Stopped"

"I been hearin' that in my dreams for twenty-five years, an' I kaint believe it yit. It was in April, the sun shinin', the grass turnin' green, an' the laylocks in bloom. Then it was like the 'arth had stopped. Thar wasn't sca'cely any tradin' done. Everything kivered with black, an' people standin' round the streets cryin'. Crowds waited at every depot from Washington to Springfield, to scatter posies on the track, an' to stand unkivered while the

A Life Mask of Lincoln

A life mask looks anything but lifelike, but it serves an important purpose. It reproduces a man's face exactly as it is and stands in the same relation to sculpture that a photograph does to a painting. In taking a life mask, the face of the sitter is covered with plaster of paris which is allowed to remain on the face for an hour or so until it becomes hardened. It is then removed and this cast is used as a mold for making the life mask itself, such as the one of Lincoln which you see here. In the same way the casts of the hands are made. In order that the sitter may breathe while his face is covered with the plaster, two quills are inserted in his nostrils which extend to the outer air.

Death masks from the faces of the distinguished dead are taken in the same way. The death mask of Napoleon is one of the best known. It would be impossible to say, merely from the look of it, which is the life mask and which the death mask of a man because in both cases the eyes, of course, are closed.

funeral car went by. We didn't keer none about him bein' president. We jist wanted Abe to come home, an' visit around with the folks that loved him. Thar won't be another man like Abe Lincoln until Judgment Day."

A Priceless Memory

A noble monument marks his grave in Springfield, Illinois. His plain old frame house there is a memorial, filled with relics, and kept open to visitors by the state. A marble temple protects the humble cabin in which he was born. His mother's grave in Indiana is marked by a shaft, in the center of a little state park. Hundreds of books have been written about him. Through numerous statues, busts, bas-reliefs, and portraits, the world has been made familiar with his tall, spare figure, heavy black hair, deep-set gray eyes, and the tender, wistful mouth which betrays his sadness. Countless stories illustrate his wisdom, humor and wide sympathies. And in his writings we have precious examples of the clearness, force and beauty of his style, and the nobility of his mind and heart.

Lincoln and Washington

With Washington, Lincoln is the one man in our history whose fame is not accounted for by anything or everything that he did. We love and revere him for what he was. His life conveys the impression of duty rather than of glory. His spirit is

timeless, his appeal universal. The humblest man may cultivate his virtues. His very dear memory admonishes every American patriot.

Lincoln at Gettysburg

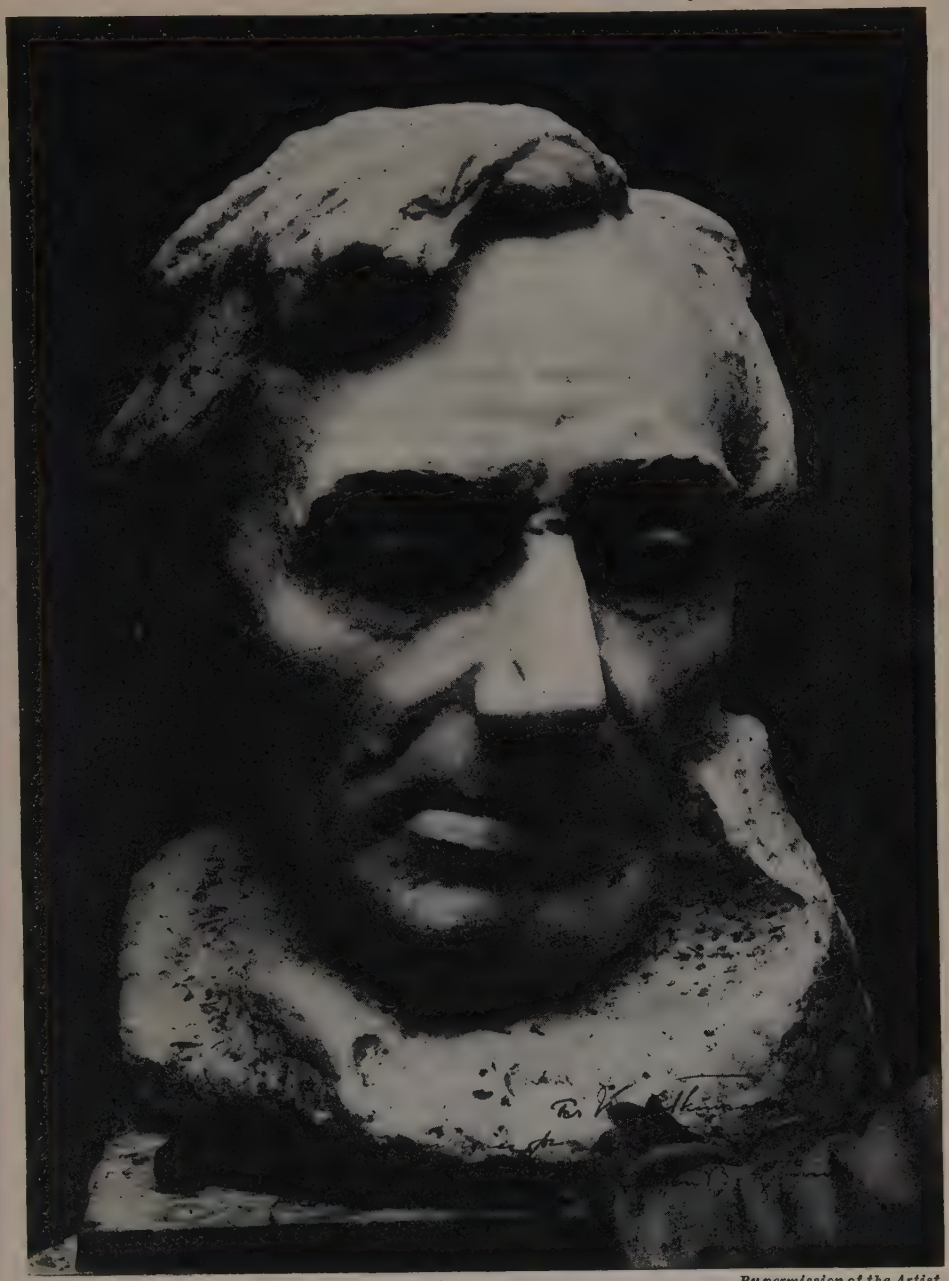
Statue by D. C. French, at Lincoln, Neb.

If the nation which he lived and died to save is not to perish from the earth, it will be because it continues to breed such men.

This is how Lincoln stood when he uttered those few but immortal words at the dedication of the battlefield of Gettysburg as a National Cemetery, and this is what he said:

"Fourscore and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a civil war, testing whether that nation, or any nation so conceived and dedicated, can long endure. We have met on a great battlefield of that war. We are met to dedicate a portion of that field as the final resting place of the men who here gave their lives that the nation might live. It is altogether fitting and proper that we should do this. But in a larger sense we cannot consecrate, we cannot hallow, this ground. The brave men, living and dead, who struggled here, have consecrated it far above our power to add or detract. The world will little note nor long remember, what we say here, but it can never forget what they did here. It is for us, the living, rather to be dedicated to the unfinished work which they who fought here have thus far so nobly carried on. It is rather for us to be here dedicated to the task remaining before us; that from these honored dead we take increased devotion to the cause for which they gave the last full measure of devotion: that we here highly resolve that these dead shall not have died in vain; that the nation shall, under God, have a new birth of freedom, and that government of the people, by the people and for the people shall not perish from the earth."

The Saddest Face in History



© Gutzon Borglum

By permission of the Artist

A great leader and statesman carrying the burdens of a nation—this is the impression given us by this head of Lincoln in the Capitol at Washington. It is the work of Gutzon Borglum, one of the most eminent of modern sculptors. As we look at it, how it reminds us, by the kindly lines of the face, the splendid thoughtfulness of the brow, the firm yet tender mouth—of this expression of Lincoln's character in words: "He had the brain of a sage, the inflexible purpose of a reformer, the tender heart of a mother."

Lincoln's Love for Children and Good Stories

This is another conception of Lincoln by Borglum. It occupies a site in front of the Essex County Court House, at Newark, N. J., and was erected by one of the local posts of the Grand Army of the Republic. The figure of Lincoln and the bench on which it rests is a favorite resting place for the children who love to play here. Lincoln himself was very fond of children and would, without doubt, have enjoyed having the very children in the picture on his knee and at his side, just as they are shown.

The Loving Father, the Boy, and the Books

AFTER he became president, he used to spend all the time he could spare from the burdens of his great work to "chum" with his little son, Tad, whose real name was Thomas, after Lincoln's father. But the President used to call him "Tadpole" and this became a family name shortened to "Tad." Opposite we see the boy and his father looking over a beautifully illustrated book with brass clasps. After he became president, people sent Mr. Lincoln a great many books and always having been fond of books himself, it was one of the delights of his life to open them in the evening with Tad standing beside him, and they would talk together as they turned the pages. It was also Mr. Lincoln's custom to read aloud to his family every morning a chapter from the Bible, and while doing so he usually had his arm around Tad, who stood close beside him. Lincoln always loved the Bible, both for its moral teachings and for the beauty and power of its language. Those who heard him read or quote the Bible say that they never listened, even to the most eloquent preachers, with the same feeling of awe and reverence.

President Lincoln, "Tad," and the Goats

Both the President and Tad were very fond of a pair of pet goats and used to play with them for an hour at a time. One day when the goats were

Lincoln and Tad

playing by themselves on the White House lawn, Lincoln called a lady to the window and said:

"Come here and look at my two goats; notice how they sniff the air and play in the sunshine." Then, as one of them jumped up in the air and came down solid on his feet, as little goats have a way of doing to express their joy of living, Lincoln said:

"Whew, what a jump!"

Tad and the Photographers

Once Tad took possession of an unoccupied room at the White House and fitted up in it a little theater with stage, curtains, orchestra, stalls, parquet and everything. A few days afterward, some photographers went into the room to develop some pictures. When Tad heard about it he was very angry because they had not asked his permission. He locked the door and wouldn't let anybody in. When his father was told about it he said, very mildly:

"Tad, go and unlock the door."

But Tad, muttering to himself, went off to his mother's room. One of the artists tried to coax him but it did no good. When Lincoln was told of it, he closed his lips firmly and going straight to Mrs. Lincoln's room returned with the key to the little theater and unlocked the door himself. Then he explained to one of the artists about Tad.

"Tad," said he, "is a peculiar boy. He was violently excited when I went to him. I said, 'Tad, do you know you are making your father a great deal of trouble?' He burst into tears and gave me the key at once."

When Tad's Father Died

When Tad was told of his father's tragic death, it nearly broke his heart. For a long time he shut himself up and would speak to no one. Then one Sunday morning when the sun had risen in the clear and beautiful sky, he looked out of the window and said to a gentleman who had called on Mrs. Lincoln:

"Do you think my father has gone to heaven?"

"I have not a doubt of it," was the reply.

"Then," said Tad in a broken voice, "I am glad he has gone there for he was never happy after he came here. This was not a good place for him!"

Little "Dan" Webster's "Other Hand"

Here is a story of Daniel Webster's boyhood that Lincoln had heard and which he loved to repeat. One day at school Dan had done something quite naughty and was called up by the teacher for punishment. In those days it was common for the teacher to punish by using a ruler on the palm of the culprit's hand. Dan's hands were very dirty—as boys' hands sometimes are. On his way up to the teacher he wiped off the palm of his right hand the best he could against his trousers. When he held it out for punishment, the teacher looked at it and said:

"Daniel, if you will find another hand in this school room as dirty as that, I'll let you off."

"Here it is, sir," said Daniel, promptly holding out his left hand.

"That will do," said the teacher, "for this time; you can take your seat, sir."

The Boy and the Lost Apple

Lincoln was so easy to get at, that people used to come to him with all sorts of little complaints. One day, in order to impress a visitor with the idea that there were too many great things in those troubled times for him to think about to permit his going into all these little matters, he told the story of a lumberman, named Jack Chase, who was known as the best raftsman on the Mississippi. Jack afterward became captain of a steamer, and when the vessel was passing the rapids he always took charge of the wheel himself. One day when the boat was plunging and wallowing through a boiling current and it was all Jack could do to keep her in the channel, a boy, who was one of the passengers, pulled his coat-tail and shouted:

"Say, Mister Captain! I wish you would just stop the boat a minute—I've lost my apple overboard!"

The Boy and the Naval School

Once there was a boy named Willie Bladen, who wanted very much to go to the naval school. He had served on a gun-boat as powder-monkey in two important battles and had conducted himself with such coolness that he had been chosen as the captain's messenger. One requirement was that a candidate for a place in the school must be fourteen years of age. When Willie heard this he cried because he would not be fourteen until the September following. A member of Congress, in whose district Willie lived,

went to the President to see what he could do. This is how he tells the rest of the story:

"Taking by the hand the little fellow—short for his age, dressed in the sailors' blue trousers and shirt,—I advanced with him to the President and said:

'Mr. President, my young friend, Willie Bladen, finds a difficulty about his appointment.' Before I got half through with the details, Mr. Lincoln laid down his spectacles, rose and said:

'Bless me! Is that the boy who did so gallantly in those two great battles? Why, I feel that I should bow to him and not he to me,' for the little fellow had made his graceful bow. Then the President took the papers and made the necessary order for the boy's appointment."

That Wonderful Dollar!

When Lincoln was a boy of eighteen, he built a little flatboat, with his mother's consent, to take some produce they had raised, down the river to New Orleans and sell it. Before he started he got an opportunity to carry some trunks on this raft to a steamer in the river. The two gentlemen to whom the trunks belonged, each tossed a half dollar. In telling the story to the members of his cabinet one evening, he said:

"I could scarcely believe my eyes as I picked up the money. Gentlemen, you may think it was a very little thing, but it was the most important incident in my life—that in less than a day I, a poor boy, had earned a dollar by honest work. The whole world seemed brighter and fairer before me. I was a more hopeful and confident being from that time."

Lincoln's High Ambition

Lincoln was, in one way, a very ambitious man. He was ambitious to do his duty in everything that came to him to do, whether large or small. And do you know that, with very few exceptions, all the men in the world who have become great, began in just this way—doing the best they could whatever work was nearest to them to do? Very few of them ever began to dream of large success until after large things began to grow out of these small beginnings.

Lincoln's feeling of gratitude that he was able to earn a dollar by honest work, governed his conduct throughout life. For instance, after he was elected president the second time he said:

"Being only mortal, after all, I should have been a little mortified if I had been beaten; but the sting would have been more than offset by the thought that the people had notified me that all my official responsibilities were soon to be lifted off my back." Doesn't that last remark remind you of what Tad said? "He never was happy after he came here. This was not a good place for him!"

A member of Congress who called on the President one morning in the winter of 1863, and found him looking more than usually pale and careworn, inquired the reason. He replied that with the bad news he had received on the previous night about a reverse of Union armies, he had not closed his eyes all night and could eat no breakfast, and exclaimed:

"How willingly would I exchange places today with the soldier who sleeps on the ground in the Army of the Potomac!"

Why Lincoln Laughed

Lincoln loved to tell and hear good stories, not only because a story is the best thing in the world with which to make a point or teach a lesson, but also because laughter, and looking at the humorous side of things occasionally were a great relief from the burdens and sadness of his own life. His laugh was very hearty. A congressman said one day as he heard the President's hearty voice in another room:

"That laugh has been the President's life preserver."

And Lincoln himself said one day that if it were not for this occasional "vent," he should die.

Minnehaha and Minneboohoo

Some gentlemen who had recently returned from what was then the "Far West," called at the White House, and, in the course of the conversation, spoke of a town in Nebraska called "Weeping Water." "That's a very picturesque name," said Mr. Lincoln, "but as 'laughing water,' according to Longfellow, is 'Minnehaha,' why didn't they give it an Indian name and call it Minneboohoo"?

The New Hat

Soon after his nomination in 1860, a hat manufacturer in Brooklyn sent him a very handsome hat which he had made especially for him. After admiring it for some moments, Mr. Lincoln put it on his head and walked up to a looking-glass. Glancing from the reflection in the mirror he said to Mrs. Lincoln, with a characteristic twinkle:

"Well, Wife, there is one thing likely to come out of this scrape, anyhow; we're going to have some new clothes!"

The Canvased Hams

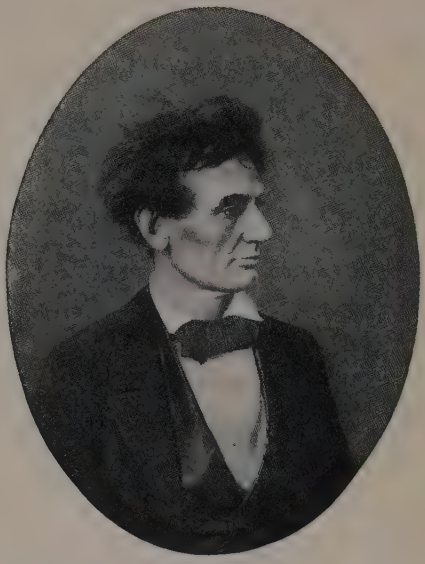
Lincoln used to joke a good deal about his own personal appearance. Among other things, about his hands. Although his hands were in good proportion to his body, he used to refer laughingly to their size. Once, when a congressman called on him, he found the president in his office dressed for a state dinner. Holding up his hands, on which were the conventional white gloves, he remarked with a laugh that an Illinois friend could never see his hands in that "predicament" without being reminded of "canvased hams."

Lincoln's Unruly Hair

Of his rough, unmanageable hair, Lincoln once said it had "a way of getting up as far as possible in the world."

But in addition to what nature had done in making his hair so "ambitious," Mr. Lincoln had a habit when approaching some knotty point or situation, of running his fingers through his hair, which tumbled it up still more.

These Pictures Show Lincoln's Habit of Tumbling His Hair



You can see that in these two portraits, one of which was taken only a few moments after the other. This was shortly after his first nomination and before he began to grow the beard that you see in his later portraits. After the negative was taken for the first of the two pictures, and before the second exposure, he got to thinking about something and up went his fingers through his hair; with the result you see.

The Mother Who Smoothed His Hair

Once a mother who had two sons in the army and so was left without support, called on Lincoln to have one of them released. He said to her:

"I know what you wish me to do and I shall do it without your asking; I shall release to you your second son."

Upon this he took up his pen and began writing the order. The poor mother standing by his side with tears running down her face could not speak, but passed her hand softly over his head, stroking his rough hair. By the time he had finished the order his own eyes were full of tears.

The Handsomest of Men

Thaddeus Stevens once called at the White House with an elderly lady whose son had been in the army, and for some military offense had been sentenced to imprisonment at hard labor. After hearing all the facts, Lincoln wrote out a pardon. As the lady was passing down the stairs with Mr. Stevens on their way out, she suddenly said with much excitement:

"Why, they told me he was an ugly looking man. He is the handsomest man I ever saw in my life!"

O Captain! My Captain!

O Captain! my Captoin! our fearful trip is done,
The ship has weathered every rack, the prize we sought is won;
The port is near, the bells I hear, the people all exulting,
While follow eyes the steady keel, the vessel grim and daring;
But, O heart! heart! heart
O the bleeding drops of red,
Where on my deck my Captain lies,
Fallen cold and dead.

O Captain! my Captain! rise up and hear the bells;
Rise up—for you the flag is flung—for you the bugle trills,
For you bouquets and ribboned wreaths—for you the shores a-crowding.
For you they call, the swaying mass, their eager faces turning;
Here Captain! dear father!
This arm beneath your head!
It is some dream that on the deck
You've fallen cold and dead.

My Captain does not answer, his lips are pale and still,
My father does not feel my arm, he has no pulse nor will.
The ship is anchored safe and sound, its voyage closed and done,
From fearful trip the victor ship comes in with object won;
Exult, O shores, and ring, O bells!
But I, with mournful tread,
Walk the deck my Captain lies,
Fallen cold and dead.

WALT WHITMAN

Three Great Military Leaders of the Civil War

First Sight of the Cavalry Group

When you visit Washington, one of these days, you will look up the Mall, one of the broad avenues leading to the Capitol and see this man galloping into view, and beyond him that immense white dome. He is a captain leading a charge in the Civil War and belongs to the Bronze Group which is part of the Grant memorial monument designed by Henry M. Shrady.

WHEN Lincoln issued his call for volunteers to defend the Union, mass meetings were held in every northern city and village. The meeting in Galena, an old Mississippi River town in northwestern Illinois, has become historic. One of the first men to come forward there was a son of Jesse Grant, an aging hardware merchant of the place. U. S. Grant was a man of thirty-nine, a shabby, middle-aged clerk in his father's store. Coming to Galena only a few years before, poor, obscure, and with nothing to say for himself, he had attracted no attention, and was generally looked upon as a failure.

Chose the Duty Nearest Him

Now he surprised the people of Galena by admitting modestly that he was a graduate of West Point Military Academy, and that he had resigned from the regular army with the rank of captain, in 1854. Very simply, he offered his services in training raw recruits. He thought he could "lick the boys into shape so they would

give a good account of themselves at the front." He was urged to go to Washington, where he would be restored to his rank in the army. There was a scarcity of trained officers, and his promotion would be rapid. He dismissed this suggestion with few words, organized a local company of volunteers and went with it to the state capital. This action was characteristic of the man. Politics and self-seeking were foreign to his nature. Like Lincoln, his ruling passion was devotion to the nearest duty.

There is nothing in Grant's early history to give any hint of his military genius. A number of other boys who were born in Point Pleasant, Ohio, the birthplace of General Harrison, who won fame as an Indian fighter in the War of 1812, also wanted to be soldiers. Hiram Ulysses Grant was not the most brilliant. It was just by dogged determination and plodding work that he prepared himself to pass the examinations and enter West Point at seventeen. This was in 1839. By an error in registering, his name was changed to Ulysses Simpson Grant. As "Simpson" was his mother's maiden name, the young cadet made no great effort to have the mistake corrected. Graduated in 1843, he was sent as a Lieutenant to Jefferson Barracks, Missouri. Before twenty-five he won distinction for gallant action in the Mexican War. Marrying Miss Julia Dent, the accomplished sister of a classmate, he spent six years in the service in California, in gold fever days.

Little Promise of His Greatness

Like Lincoln, a Failure in Business

He resigned from the army because there was little to do. It is true that the storm of the Civil War was gathering; but there had been talk of war for more than twenty years, and most of the people in the country thought there was too much smoke for any danger of fire. Captain Grant opened a real estate office in St. Louis, and also worked a small farm near the city. Like Lincoln and many other great men, he was a failure in business. His military title would have been a help to him, but he made no use of it. His office was soon closed. For a few years he was seen in the residence districts of the city, delivering cord wood in a farm wagon. This appeared to be his only source of income. Then he disappeared. Getting deeply into debt, he was obliged to sell his farm, and to remove his family to Galena. All his father could do for him was to offer him the small but regular wages of a clerk in his hardware store.

In the training camp at Springfield, Illinois, his ability was recognized at once. Within a month he was made colonel of an infantry regiment. By August he was in the field as a brigadier-general, with headquarters at Cairo, and given the task of pushing southward, along both banks of the Mississippi. He was only an officer of volunteers, but, as a matter of fact, the great opportunity to make a military reputation, during the early years of the war, lay in the West. While Grant steadily smashed his way to Vicksburg, four generals, commanding the army of the Potomac, found themselves unable to make any headway against General Lee in Virginia.

His Talent Begins to Be Recognized

Grant's first move was to capture Paducah, and secure Kentucky for

the Union. His campaign was marked by military strategy, and aggressiveness. In November he routed the Confederate forces in Missouri. By February, 1862, he had pushed into western Tennessee. It was at the siege of Fort Donelson, where he captured a garrison of 14,000 men, that he wrote his famous "unconditional surrender" note that won him his nickname. It was as a major-general that he advanced to Shiloh, Iuka and Corinth. Leaving a series of brilliant victories behind him, he moved on Vicksburg. This fortified river port in Mississippi surrendered, with its garrison of 32,000 men, in July of 1863.

The Gunners and the Big Guns

This is the artillery group of the Grant monument. The gunners are shown sitting on the "limber." The limber consists of two wheels, an axle and a pole to which the horses are attached. The frame of the limber also supports one or more ammunition chests on which the gunners usually sit. When the guns are being got ready for action, the limber is detached from the gun carriage and so you hear the expression, "unlimbering the guns." As you may imagine, it isn't an easy thing to ride on the limber of a gun, and the men are here shown holding on, because there is a sudden jolt. The captain will give the order to unlimber in a few minutes. The gunners will then jump down and load the piece.

Farragut, by a naval expedition from the Gulf, had captured New Orleans the year before, and, then, after sixteen months of galling work, under fire, had cleared the lower end of the river of Confederate fortifications, mines and gunboats. The river open, "unfettered from its source to the sea," as Lincoln said, and with Missouri, Arkansas, Texas and Louisiana lost to the Confederacy, Grant turned eastward to the relief of the Federal army, besieged and cut off from supplies, at Chattanooga. Tennessee was won in two battles, at Lookout Mountain and on Mission Ridge, in November, and the way was opened for Sherman's march through Georgia to the sea. By this plan the Confederacy was to be divided again, and Mississippi, Alabama, Georgia, and Florida conquered. Farragut's part was to take Mobile from the Gulf.

Pitted Against General Lee

A Contest Between Two Giants

Grant was called from the West; made Lieutenant-General of the Union armies, and given the supreme task of driving back and forcing the surrender of General Robert E. Lee. For three years this Confederate leader had operated in Virginia, crossed Maryland, and penetrated into southern Penn-

The Brilliant Leader of the Southern Armies

© *Detroit Publishing Co.*

This portrait of Lee, which is to be seen in the Corcoran Gallery of Art in Washington, expresses admirably the character of a very intellectual man of good breeding and polished manners. It expresses no less the man who refused a high command in the Federal armies with certainty of rapid promotion and consented to lead the armies of the South in what he must have known was probably a lost cause because he believed his duty and service lay with his own state rather than with that of the national government. Although he fought a losing fight, he left a record as one of the greatest generals, as well as one of the noblest characters, in all history.

The Man of Steady Purpose

A man of quite a different type from General Lee, but equally unselfish and equally patriotic was General Grant. We can read in this fine portrait the steady purpose, the firm determination which sent the message to the Chief of Staff at Washington: "I propose to fight it out on this line if it takes all summer." Both Lee and Grant had seen service in the Mexican War and each had the greatest respect for the other's character and abilities. On the day of surrender at Appomattox, the great leaders, after shaking hands chatted over incidents of the Mexican conflict before Grant drew up the simple terms of surrender to which Lee subscribed his name.

sylvania. He had lost battles, but had always escaped with his army. He had broken the reputations of four Union commanders of the Army of the Potomac. And even after his crushing defeat at Gettysburg he had retired in good order. He found his match in "Unconditional Surrender" Grant. All the western world watched the titanic duel between the two great commanders of armies that were produced by the Civil War.

Grant moved southward in March of 1864, and soon met the enemy in the terrible Battle of The Wilderness. Criticized for his sacrifice of troops in his smashing drives, Grant replied tersely: "I'll fight it out on this line if it takes all summer." There was, indeed, no other way to conquer Lee and end the war. It took all summer and all winter, and into the early months of the next spring. Sherman reached Savannah before Christmas, while Grant was still fighting Lee at Spottsylvania, at North Anna and Cold Harbor. Slowly Lee's exhausted, ill-supplied army was pressed back. But it stood a long siege at Petersburg; escaped from that city and from Richmond, and made a last gallant stand at Appomattox Courthouse. The Confederate armies surrendered on April 9th, 1865. The war was over.

Grant's Saddle and the Story of the Teamster

This is the saddle and bridle used by Grant in his campaigns and is one of the relics of her great General which the State of Illinois preserves in the collection of the Chicago Historical Society. Grant was fond not only of the noble horse that bore him through so many battles, but of horses in general, and one of the only two occasions in which he lost his temper during the Civil War, was when he saw a teamster beating a horse over the head. Throwing himself from this saddle, he seized the teamster, who was a big coarse man, by the throat and shook him furiously.

His Attitude Toward Lee

Hailed as the deliverer of the nation, General Grant went to Washington to hasten the disbanding of the army. With noble magnanimity he had refused to take Lee's sword from him, and to the Confederate

troops he had left their horses; "to ride home and use in plowing their ravaged fields." He threatened to resign if Lee was tried for treason.

His Election to the Presidency

In 1868, General Grant was elected president, the third "hero on horseback" to ride into the White House. The other two were Indian fighters in the War of 1812—General Jackson elected in 1828, and General Harrison in 1840. As a president, Grant's personal conduct was marked by the same characteristics as when he commanded armies. His eight years in office covered most of the difficult period of reconstruction in the South, and the retirement of the paper money issued during the war. Politics were bitter and times hard. A soldier who did not understand political methods, his confidence was sometimes betrayed. He made a real contribution to good government by securing the passage of the first civil service reform bill; and he clarified international relations in his treaty with Great Britain, in which was defined the rights of neutral nations in time of war.

East and West were in rivalry to do him honor, when he made his tour around the world in 1877. On his return home he found himself too poor to maintain his family in his enforced prominent position. The salary of the president was, at that time, only $25,000 a year, and he had been able to save little. Investing his capital and lending his name to a banking firm, he was robbed by dishonest partners and connected with a disgraceful failure. A fall had injured him so that he was obliged to use a crutch.

Union Soldiers Sharing Their Rations

From Fiske's History of the U. S.
Courtesy Houghton Mifflin Co

There were many times during the Civil War when the soldiers on both sides showed that they felt toward one another like brothers, although they were fighting on opposite sides. This picture shows Union soldiers sharing their rations with the half-starved men in gray.

The Death of a Hero

Bankrupt, crippled, dying of cancer of the tongue, at the age of sixty-two, the last year of his life was the most heroic. A publishing company had offered him a large sum and heavy royalties for his memoirs. So he earned a fortune for his family. He dictated to his secretary for hours, every day, when it was agony for him to speak. The work

Dictation of His Memoirs

fills two large volumes, and literary critics have compared his military autobiography with Caesar's Commentaries. He fought out his last battle on that line. The task was completed only four days before his death at Saratoga, New York, in July, 1885.

Robert E. Lee

ONE of the pleasantest discoveries, in reading American history, is that so many of our great men won nicknames that were tributes of affection and admiration from the people of their time. To Robert E. Lee, the military genius of the Confederate States, was given the title of loving respect that was used by his negro servants on the beautiful estate of Arlington, were he was "master." To the entire South he was, and is today, "Marse Robert."

His Affectionate Nickname

His Belief in States' Rights

To understand General Lee, the noblest of all the men who took up arms against the Union in the Civil War, you must remember, that from the framing of the Constitution, the most patriotic men in the country were divided on the question whether we should have a strong federal government, or a loose confederation of sovereign states. Had they been living at the time of the Civil War, Washington and Hamilton would have been true to their principles in defending the Union. Jefferson, equally patriotic, would, in all probability, have decided that he owed fealty to his native state of Virginia. Federalist sentiment was always strongest in the North; Democratic principles finally dominated the South.

Robert E. Lee was a Virginian, born in 1807, the son of "Lighthorse" Harry Lee of Revolutionary fame. Two of his ancestors were signers of the Declaration of Independence, and political disciples of Jefferson. Other members of the family served in the Constitutional Convention, in Congress, and in the army. The Lees were the Adamses of Virginia. Every generation furnished its distinguished men to the public service. It was in accordance with family traditions that Robert E. Lee, and his son after him, should go to the West Point Military Academy. Taking the engineering course, he was graduated with honors at twenty-three. Two years later he was married to Miss Mary Custis, a great-granddaughter of Martha Washington, and heiress of the estate of Arlington, on the Potomac River opposite the Capital.

His Distinguished Ancestry

Fortune seemed to have marked Robert E. Lee for its own. He had birth, wealth, a cultivated mind, courtly manners, a handsome face, personal happiness and, as the years went by, he added eminence in his profession. As chief engineer of the army, he won distinction in the Mexican War. Then, as Superintendent of West Point Academy in the fifties, he introduced the best military methods of Europe. While there he admonished his own son, among other cadets:

How Much He Had to Sacrifice

"Duty is the sublimest word in the human language. You cannot do more than your duty; you should never wish to do less."

When Virginia seceded from the Union, Lee was confronted with the question whether his duty was due

to his country or to his home state. In deciding to resign his commission in the army, and offer his services to Virginia, it must not be forgotten that he sacrificed every material interest. Immediate promotion to command of the Union armies awaited him, with protection for his family and home within the fortifications of the Capital. He was a ruined man; his wife's birthplace and his children's inheritance lost, his family in exile, and Union troops encamped on beautiful Arlington. when he deliberately chose to lead what he must have known to be a hopeless cause.

Historians are agreed that, in Robert E. Lee, the federal government lost a military genius. Not until General Grant was developed by the campaigns in the West, did the northern army produce his equal. It was his superior organization, strategy and engineering which enabled him to hold Virginia in a deadly grip for three years. From April, 1861, to July, 1863, he fought a dozen historic battles, crossed Maryland, and penetrated into southern Pennsylvania. He was not always the victor—was defeated at Antietam and Gettysburg; but he always managed to retreat in good order, to save his army, and to protect the roads to Richmond. As we have said in the sketch of Grant, he successively discredited, and brought to failure the plans of four Union generals placed in command of the Army of the Potomac.

When Grant was called from the West and began his march toward "The Wilderness," in the spring of 1864, Lee still menaced the Capital. Then, for a year, his ragged and starving armies, while slowly retreating contested every vantage ground in a half-dozen pitched battles. He stood a long siege and escaped from Petersburg and from Richmond, before he was conquered at Appomattox Courthouse.

Lee's surrender ended the war; and he need not have surrendered. By breaking up his army into bands of guerillas and retreating to the mountains, he could have prolonged the struggle indefinitely. This he refused to do. With a nobility rare in history, he accepted defeat and shared the ruin of the southern people. Foreign governments offered him wealth and the highest military offices, in return for his services. But, although impoverished and prematurely aged by the war, with Arlington confiscated and turned into a national cemetery, he set himself to the task of making his country once more a union of loyal states. He accepted the presidency of Washington and Lee University at Lexington, Virginia. Its doors had been closed for four years. Within the next five years 900 students came under his influence. By his spirit of resignation, and co-operation with the government, he cooled the hot heads and sweetened the bitter hearts of the rising generation. This was his last call to duty, his part in the work of reconstruction that finally built up a New South.

General Lee and the New South

He knew that, dreadful as was the ruin, it would be repaired in time, and Blue and Gray would clasp hands above the many graves of the Civil War. But the day of restoration and reconciliation must have seemed far away indeed when, in October, 1870, "Marse Robert" fell asleep, and was laid away under the college chapel.

On the 19th of January, 1907, the

A Closer View of the Cavalry Group

Here we see the whole cavalry group. The horses seem mixed up because they are no longer in the line formation with which a cavalry charge begins. After the first formal charge, there are apt to be little side skirmishes over the battlefield and the ranks are broken up just as shown here. The ground is very rough and one of the horses has fallen.

centenary of his birth was celebrated, not only by Virginia and the South, but by the nation. All parties, and the press of every political opinion, united to honor one of our greatest soldiers and noblest characters. His eulogy was pronounced by an Adams of Massachusetts.

David Glasgow Farragut

AT the beginning of the Civil War another eminent man was placed in the same difficult position as General Lee. This was Commodore Farragut, who had been in the United States naval service for a half-century, although he was only sixty years old. Born in Tennessee in 1801, the year Jefferson was inaugurated president, he had found a wife and a permanent home in Virginia. His heart torn between love for his country and for the South, he did not hesitate a moment in his decision that his fealty belonged to the Union.

How Farragut Decided

A Midshipman at the Age of Ten

A few years before his birth his father, who belonged to an old Spanish family of the Gulf Coast, emigrated to the little backwoods settlement of Knoxville, Tennessee. The mother was of Scotch descent, which accounts for the son being christened David Glasgow. Like many other pioneers of that early day, the Farraguts had the best of social connections in the East and South. One of the friends who did not forget them was Commodore Porter of the navy. He offered the little son a berth as midshipman. As our naval academy at Annapolis was not established until 1845, cadets were then taken at an early age, and trained on shipboard, at sea. Farragut was only ten years old when he left his backwoods home, journeyed across the mountains, and was put aboard the frigate *Essex*. There with other homesick boys, he went to school every minute he was awake,

The Saint Gaudens Statue of Farragut

© Underwood & Underwood

This is the famous statue of Farragut by Augustus Saint Gaudens. It stands in Madison Square, New York City. The Admiral is represented as watching an action at sea. His frock coat is buttoned close and the skirt flies loose in the wind. In his hand he holds a double field glass. The legs are a little apart as would be natural on shipboard, and his face and attitude expresses the chief commander, conscious of his responsibility; the man to whose skill, courage and judgment has been committed the life of his men and the honor of his country. A French critic, speaking of the original design of the statue as it was exhibited in Paris, says that the whole figure expresses "the boldness of conception and initiative force peculiar to Americans."

The figure surmounts a curving wall with a seat like the outdoor marble benches of the Greeks. Each of the two arms of the seat are formed by the curved back of a fish, typical of the sea. Across the base of the statue are sea waves. The sword is symbolic of battle, while the two female figures represent Loyalty and Courage.

learning to be a sailor, a scholar and a gentleman.

Within two years he was in the thick of the naval fighting of the War of 1812. In the sea battle off Valparaiso, Chile, the young "middy" acted as powder boy; and he took a prize ship into the harbor of Santiago. Then followed forty-five years of routine duty. He lived on training-ships, instructing classes of cadets. He tested naval guns; made long cruises at sea; superintended the work of constructing the naval station of Mare Island at San Francisco, and helped plan the equipment and the course of instruction of the new naval academy.

Penalty of a Neglected Navy

In all his long service there had, with the exception of the introduction of steam, been very little improvement in naval construction. American merchant ships, both sail and steam, were on every ocean, trading in every port of the world, but because of our long peace and our sense of security in the protection of two wide oceans, the government had grown careless. In 1861 our navy had dwindled to ninety vessels of all classes. Only forty of these were steamships. Many were in foreign ports at the time of the firing on Fort Sumter; and as there were no ocean cables to call them home quickly, it took weeks to reach them by mail. Others were undergoing repairs; some were condemned as unseaworthy, or had to be equipped with modern guns and supplies. A total of only thirteen vessels were ready for instant use.

And Then Came the Great War

Naval commanders were dismayed by the task before them, with the old-fashioned, insignificant fleet at their service. The coast, from Virginia to Texas, had to be blockaded, to cut off the foreign trade of the South. Seaports and forts had to be captured, and the great bays—especially the Chesapeake—guarded; commerce protected; blockade runners brought in as prizes, or sunk; and the cruisers that the Confederacy was certain to purchase abroad, chased and destroyed.

Merchant steamers were sent out to bring naval vessels home; others were built as rapidly as possible, and ships in the merchant marine were purchased and refitted. Within a few months we had four hundred naval vessels, and John Ericsson was building the iron-clad "Monitor" which, with the Confederate "Merrimac," was to revolutionize naval construction. Admiral Farragut, however, fought his historic battles with wooden ships.

The Task Set Before Him

The war was only nine months old, and Grant was in western Tennessee, when Farragut was sent to clear the lower Mississippi of Confederate forts and gunboats, and captured New Orleans. He was given a fleet of forty-eight vessels mounted with two hundred guns, the largest ever fitted out by the government up to that time. But not one of his ships was an iron-clad; quite half of them were sailing vessels, almost impossible to maneuvre in the narrow, winding channels of the river where there was seldom enough wind to fill the sails; and even the steamers had been built for sea service.

A Master of Strategy and Daring

Modern naval battles,—those of Dewey at Manila, Togo in the Japan Sea, and the engagements of the great European war which began in 1914, cannot be properly compared with the feats of Farragut of more than a half-century before, for all the conditions of modern naval construction and gunnery are different. His fleet and weapons were very little better than those of Nelson in the Napoleonic wars of fifty years before; the difficulties that he overcame were much greater, and his operations extended over a longer period of time. In daring he matched Paul Jones of Revolutionary fame, while as a master of strategy he was the equal of Grant or Lee on land.

New Orleans was well defended. The Eads jetties had not yet been built to open and deepen the South

The Brave Man with the Tender Heart

© *Horace K. Turner & Company, Boston*

This is the great naval commander after fifty years in the service of his country. Like England's hero, Nelson, he began his naval career as a boy. When only twelve he took a prizeship in the War of 1812, into Santiago, Chile, and served as powder-boy in the battle of Valparaiso.

Utterly fearless as to his personal safety, and of incredible daring in an attack, he had, like other brave men, a very tender heart. After the battle of Mobile Bay when the dead were laid out on the deck on the flag ship, he could not speak for weeping.

Farragut and the Pilot's Foot at Mobile Bay

Here is how the painter, W. H. Overand, tells us about the battle of Mobile Bay. The original of the painting is in the Wadsworth Athenaeum at Hartford. The general character of the action is well shown, but it is not absolutely accurate as to details. Farragut stood in the main rigging as here shown, but higher up near the platform surrounding the head of the lower mast, because from this high position he could get a wide view of all that was going on. This platform is called the "top," and, as you can see by turning to the word in your unabridged dictionary, has a hole in it called the "lubber's hole." Farragut standing in the rigging, reached his arm through the lubber's hole and took hold of the foot of the pilot who was standing on the "top." Whenever he wanted to give an order, he squeezed the pilot's foot as a signal. The pilot bent his ear down to the lubber's hole, got the order and then turning, shouted it to the helmsman. It was only by such an arrangement that the voice of the commander away up in the rigging could be heard above the noise of the battle.

Pass. The narrow channel was so choked with mud that vessels were always in danger of running aground. And as soon as the fleet reached deep water it found the river crossed by great chain cables fastened to anchored barges. Above the cables, and seventy-five miles below the city, the Mississippi was flanked by two forts mounted with naval guns. The bed of the channel was sown with mines, and above the forts waited a flotilla of Confederate gunboats.

How New Orleans Was Defended

Farragut boldly entered the river, and worked his way through shallow water up to the cables. For a week he bombarded the forts, while they tried to destroy his fleet. Cutting the cables and towing away the barges, he plowed over the mines and ran past the forts, under dreadful fire. Then he engaged the flotilla of gunboats, sank them and captured New Orleans. General Butler, waiting on Ship Island, with an army of 15,000 men, marched in and occupied the city. The task was completed in three months' time, with the loss of one ship and thirty-seven men.

A Wonderful Victory

Why He Was Called "Old Salamander"

For the next sixteen months, while Grant was moving southward and laying siege to Vicksburg, Farragut worked his way up stream, so continuously under fire from shore for-

tifications and gunboats, and so invariably the victor, that he won the nickname of "Old Salamander." And then, the Mississippi conquered, he descended to the Gulf. In 1864, as a part of Sherman's campaign across Georgia to Savannah, he fought the battle of Mobile—one of the most brilliant victories in naval history. The poet Holmes called him:

"The Viking of the River Fight,
The conqueror of the Bay."

As was the case with General Lee, the war wrecked his health. He was retired soon afterward with the rank of Admiral, which was created to reward his services and to give recognition to his genius as the greatest of American naval heroes. A statue of him was erected in Farragut Square, Washington; and New York City has another, modeled by Saint Gaudens, the sculptor of the Lincoln statue in Lincoln Park, Chicago.

Compared to Lord Nelson

In character we are proud to find in Admiral Farragut the finest qualities of Lord Nelson, England's naval hero of the battles of Copenhagen, the Nile and Trafalgar. Beginning his services at the age of ten, as Nelson began his at thirteen, he had done every kind of work in seamanship, gunnery and naval construction. At any moment he could have taken the place, and done the work, of any man on his fleet.

He Wept at Sight of the Dead

Honest, upright, religious, a strict disciplinarian, but of quick sympathies, he commanded respect and instant obedience, but he also inspired enthusiasm and won the warmest affection. As tender-hearted as Nelson, he wept like a child when the dead were laid out on deck, after the battle of Mobile.

"The bravest are the tenderest,
The loving are the daring."

Sheridan's Ride

Up from the South at break of day
Bringing to Winchester fresh dismay,
The affrighted air with a shudder bore,
Like a herald in haste, to the chieftain's door,
The terrible grumble and rumble, and roar,
Telling the battle was on once more—
And Sheridan twenty miles away.
And wider still those billows of war
Thundered along the horizon's bar;
And louder yet into Winchester rolled
The roar of that red sea uncontrolled,
Making the blood of the listener cold,
As he thought of the stake in that fiery fray—
And Sheridan twenty miles away.

But there is a road from Winchester town,
A good, broad highway leading down;
And there, through the flush of the morning light,
A steed as black as the steeds of night
Was seen to pass as with eagle flight;

* * * *

Still spring from those swift hoofs, thundering South,
The dust, like smoke from the cannon's mouth,
Or the trail of a comet, sweeping faster and faster,
Forboding to traitors the doom of disaster.
The heart of the steed and the heart of the master,
Were beating like prisoners assaulting their walls,
Impatient to be where the battle field calls:
Every nerve of the charger was strained to full play,
With Sheridan only ten miles away.

Under his spurning feet the road
Like an arrowy Alpine river flowed,
And the landscape sped away behind
Like an ocean flying before the wind,
And the steed, like a bark fed with furnace fire,
Swept on, with his wild eye full of fire.
But lo! He is nearing his heart's desire:
He is snuffing the smoke of the roaring fray,
With Sheridan only five miles away.

The first that the general saw were the groups
Of stragglers, and then the retreating troops.
What was done—what to do? A glance told him both.
Then, striking his spurs, with a terrible oath
He dashed down the line, 'mid a storm of huzzas,
And the wave of retreat checked its course there, because
The sight of the master compelled it to pause.
With foam and with dust the black charger was gray;
By the flash of his eye and the red nostrils' play,
He seemed to the whole great army to say:
"I have brought you Sheridan all the way
From Winchester down to save the day."

Hurrah! hurrah for Sheridan!
Hurrah! Hurrah for horse and man!
And when their statues are placed on high,
Under the dome of the Union sky,
The American soldiers' Temple of Fame,
There, with the glorious general's name,
Be it said, in letters both bold and bright:
"Here is the steed that saved the day,
By carrying Sheridan into the fight,
From Winchester, twenty miles away!"

T. Buchanan Read

The People of the United States and Their Welfare

FROM the beginning of its history in the thirteen English colonies, our country has had a mixed population. English Puritans, Quakers and Cavaliers; Scotch, Scotch-Irish and Irish Catholics; Welsh, Dutch, Belgians, Swedes, Germans, and French Huguenots were all in America, in varying numbers, before 1700.

They differed widely in language, manners, customs and religious beliefs, but within the short period of a century and a half they had become so far united in feeling and interests that they formed a new nation, with a clear and original political ideal.

We are apt to think that this is a new thing in history. It is not. The greatest of all the ancient empires were peopled by mixed nationalities and even races. Venice and Genoa, in Columbus' day, had as many varieties of foreigners as London, New York and Chicago have today. The people of England are a mixture of ancient Britons and Celts with Romans, Anglo-Saxons, Norse, Danes and Norman French. Several centuries have been needed to blend all these various elements into English men. So "Americans" have become a distinct people, quite unlike any people of the countries of their ancestry. And our characteristics are probably not fixed, for new nationalities are still coming and being absorbed into our national life.

Within the half century from 1790 to 1840, our country grew in population from three to seventeen million. Large fami-

All for the Children

As you are approaching the beautiful pillared temple shown in the next picture, you would see from the sculptured groups on either side of the main entrance that it had something to do with children, and then when you notice they are all happily engaged in learning about things, you would suspect the whole truth—that it is all devoted to the work of the schools of the state. This group of little people is in bronze and they are all seated around a capital of one of the Egyptian patterns as you can see by the locust leaves. Above the pillar stands a circle of solemn owls signifying wisdom.

A Great Temple of Education

One of the very greatest things that the United States have done both individually and in their united form as one country, has been to develop the public school system. And the great empire state, New York, has lead them all in the beautiful building shown here, which is the center of all the education activities conducted by the state. This is the State Education Building at Albany. It is the headquarters of the State Department of Visual Instruction and all the other educational activities maintained by the state. It is built in the style of a Greek temple with its magnificent rows of columns.

lies were the rule in pioneer days, but there was also a steady stream of newcomers, chiefly from England, Ireland and Germany. Entering through Boston, New York, and Philadelphia, they were soon well distributed among the older colonial population; and being of the same national stocks as the people already here, they very quickly became good and useful citizens. In the frontier village of New Salem, Illinois, where Lincoln studied law in the thirties, there was a Scotch schoolmaster, a French doctor, a German cooper and miller, and an Irish "gentleman" who loaned him copies of Burns and Shakespeare. This was a typical pioneer settlement.

The Waves of Immigration

Famine in Ireland in 1846, and revolution in several of the states of Germany, caused still larger waves of migration from those countries to break upon our shores. Between 1840 and 1860 the population was almost doubled. In the third quarter of the nineteenth century, German and Irish immigrants did our hardest work. They dug the canals, graded the early railroads, built the levees of the Mississippi, and constructed our first great bridges. They manned the multiplying factories, cleared the farming lands of new western states, worked in all the skilled trades, and opened new shops and stores in towns and cities. They built churches, appeared in the learned professions and in politics, and formed entire regiments to

fight for the Union in the war between the States.

What Foreign Peoples Bring Us

Then, for a score of years after 1870, most of the new arrivals were from Norway, Sweden and Holland. These sturdy farmers of North Europe poured into the forest and lake country of Michigan, Wisconsin and Minnesota, and spread westward across the prairies of the Northwest, multiplying our corn and wheat fields, orchards, gardens, and pastures for dairy cattle. Except for the Negroes who were brought in for slaves, a few Polish, Bohemian and Jewish exiles in the larger cities, and the Chinese who swarmed into California in gold-fever days, practically all our immigrants, from 1607 to 1890, were from the enlightened countries of Northern Europe. Vigorous, venturesome and of keen intelligence, they were marked by the pioneer spirit, by nervous energy and a many-sided genius.

Since that date, however, hordes of strange peoples have poured in upon us from Italy, and from the backward countries of Southeastern Europe—the many nationalities of Austria-Hungary and the Balkan States; Poles, Greeks, Russian Jews, and even Armenians and Syrians from Asia Minor. These people are mostly illiterate and unskiled, and entirely alien to our language, customs, and political institutions; but all are eager to improve their worth and fortunes, and each has some special virtue—patience, sympathy, imagination or reverence for Art, to modify our sterner qualities, and to give color and softness to our national life. Willing to do our hardest work, we find the strong peasantry of country districts in the coal and iron mines, the stone quarries, steel mills, packing houses and railroad camps. The physically weaker, but mentally more alert, people from the crowded slums of foreign cities, find work for their nimble fingers in clothing, box and canning factories. We see them, too, peddling fruits and vegetables from wagons and push carts, and shining shoes. Those who prosper very soon own fruit stands, pawn shops, tailor shops, and barber shops and second-hand clothing stores.

Inferior Types of Immigrants

Immigrants Who Are Barred Out

The conditions of their work tend to keep these people isolated in racial groups, in mining and factory towns, and in the poor quarters of the large cities. But the children are quickly gathered into the public schools, and many of the second generation become a part of the general population. This process is going on all the time. But while our country was founded as an asylum for the poor and oppressed of all lands, we admit no alien who would endanger our free institutions or who would be liable to become a public charge. This excludes the insane, the feeble-minded, those with incurable or contagious diseases, the man with a criminal record, the pauper family, and the children and old people without responsible guardians. Chinese coolies, or common laborers, who work so cheap that they lower the wages and the standard of living of American workmen, are not allowed to come in, and, for the same reason, we have an agreement with the government of Japan not to permit the migration of Japanese coolies to this country.

From 1900 to 1910 a million new

people entered the United States every year. Then the number began to decline, and during the great European War, which began in 1914, more aliens left our country, to serve in various foreign armies, than came into it. Until an immigrant becomes a naturalized citizen of the United States, you know, he owes allegiance to his native land.

One of the Doctors on Guard at the Ports

You can see by the badge on his cap that this man with the fine, strong face is working for Uncle Sam; and so, of course, for all the rest of us. He is a doctor by profession and is one of the medical inspectors at the port of New York who sees to the enforcement of the quarantine and laws.

In 1915 the United States had a population estimated at one hundred million. At least one-sixth of this number were foreign born, and fully one-half were of recent foreign ancestry. Twenty-six million immigrants had entered the country since 1790. Not more than one-tenth of our people of today are descended from the patriots who won our liberties in the Revolutionary War. An equal number of our citizens are descended from the negroes who, a half century ago, were held in slavery. The native Indians who decreased in the two centuries of Indian wars, are now increasing slowly, and number over a quarter of a million.

Making One People of Many

While there have been such mixed populations in other historic times and places, never before were so many and such various peoples so quickly blended into one nation. A large part of this result is due to our republican institutions—to our political equality, religious tolerance, lack of class distinctions which has permitted the freest social intercourse, and universal, free education in a common language. But we must not forget that, never before in the history of the world, were travel, trade and communication so rapid, easy and cheap as in this age of the steamboat, railroad, telegraph and postal service. For all practical purposes our big country is smaller than it was a century ago. The journey from New York to San Francisco can now be made with greater ease and comfort and at less expenditure of money and time, than the trip from Boston to Philadelphia in Revolutionary days.

Promoting the General Welfare

The Nation's Duty to Its Citizens

And then this is an age in which all progressive governments have a function of social service toward their citizens. In old times there was a kind hearted king of France who wished that every family in his dominion had a fat chicken for their Sunday dinner. But it did not occur to him that he could do anything toward making his people more prosperous. The wise and patriotic men who founded our gov-

Waiting for Mother at Quarantine

These immigrant children, two little brothers and pretty baby sister, are waiting, and watching the family baggage at quarantine, while their mother is being examined.

The Woman Doctor-Inspector and the Woman Immigrant

This is the mother of the three little children that we saw in the main room at the immigrant station. The doctor-inspector is examining the action of the heart and lungs with the stethoscope.

The Doctor-Inspector Examining the Boy's Eyes

Here one of the doctor-inspectors is examining a boy's eyes. By such an examination the inspector can not only tell if there is any disease of the eyes but the condition of the eyes is also an indication as to serious diseases of the rest of the body. You notice how the immigrant back of the boy is smiling. He has probably made some joking remark to reassure the little fellow who seems to be somewhat apprehensive as to what is going to be done to him.

Using the Stethoscope on an Immigrant Boy

Here you see a medical inspector in the port of New York listening to the action of the heart and lungs of an immigrant lad who has just arrived. He is such a fine, sturdy-looking youngster that probably the doctor's report will be favorable and the boy will come to be a useful American citizen.

The First United States Stage Entering El Paso

Painted by Edwin J. Holslag © *Edwin J. Holslag Co.*

Before the days of railroads in the Far West, mail and passengers were carried from place to place in stage coaches drawn by several teams of mules or horses. This picture shows the first United States stage entering El Paso. You notice that the men on the driver's box wear tall pointed hats with broad rims, like the Mexicans, because this is a hot climate and hats of this kind are the most comfortable. El Paso, you know, is the northwestern gateway into Mexico. The population is quite mixed, including many Mexicans, Indians, and half-breeds. Five great railway lines now center here.

ernment were among the first in the world to consider it the duty of rulers to do everything possible to improve the general standard of living and the well-being of all the people. In the first paragraph of the Constitution they gave, as one of the reasons for forming a Union of the States, the purpose *to promote the general welfare.*

The first thing done under this power, was to extend and perfect the postal service. President Washington had a small cabinet of only five members. These were secretaries of State, the Treasury, War, and the Navy. The fifth member was the Postmaster-General. Nothing was thought to be of more importance than cheap and easy communication between the people of every part of the country. This, it was wisely foreseen, would encourage education, facilitate business, and create common interests that would serve to knit the people closer together.

Beginnings of the Postal System

Sending Letters in the Old Days

This idea was not new. A colonial postal system, of a sort, was in operation very early. In every seaport, bags of mail were entrusted to ship captains, who, for stated fees, delivered them to banks or business houses in London. Every business man and planter in the colonies had his London agent. Neither the colonial nor the home government was in any way responsible for the safe transmission of mails. Important letters were sent by private messenger. The common people did not write or receive letters at all, and so lost all trace of relatives and friends in the Old World, and of those in other colonies. It was not until 1753 that Benjamin Franklin undertook to organize a system of post offices and mail routes for the American Colonies. By boat and carriage and on horseback he travelled from Boston to Charleston. He

One Way of Preventing Floods

This shows one of the ways by which the Government reduces the number of floods in the Mississippi. The river is constantly carrying down branches of trees and twigs and even whole trees that have fallen into it from its banks. This material if allowed to accumulate in the bottom of the river, checks the flow of water and so increases floods. Accordingly, frame structures like that shown here were built out into the streams which catch this material and so permit it to be removed.

established seventy-five central post offices, fixed proper rates and appointed postmasters and mail carriers.

The Revolutionary War interrupted this work. In 1790 there were still only seventy-five post offices to serve the needs of three million people who were hungry for news of their friends, and of the large affairs of their new republic and of the world. But by 1800 the President and his Postmaster-General and Congress, working together, had increased the number to nine hundred. There were twenty-three hundred post offices in the country when Lincoln was born in 1809. Did you fully realize what this wonderful service of our government means to us today, before you had read our story, "The Magical Powers of a Postage Stamp"?

Improvements of the Waterways

The next general welfare work undertaken was to make travel and trade safer. Since the harbors and navigable rivers were necessary to national defense, the federal government assumed all rights over them and charged itself with their improvement. It deepened channels, built jetties and breakwaters and erected lighthouses. Although known to the ancient empires around the Mediterranean Sea, these safeguards were new in the modern world. In 1800 there were only twenty-five lighthouses around the dangerous coasts of the British Isles. The American Colonies, in 1790, had nothing more than beacon lights on the points of land and hilltops overlooking harbors. That is how Beacon Hill, Boston, got its name.

The United States government

The Old Erie Canal Today

The Erie Canal which had so much to do with the development of our country, is still in existence and performing invaluable service in the cheap carriage of freight. All the canals in New York state have now been united into one system called the State Barge Canal, and the Erie is part of this system. The illustration shows one end of what is known as the crescent dam on the Erie during the spring flood. You see the dam practically keeps the water back so that there will be plenty for the operation of the canal, but in times of flood the water rises until it comes to these openings in the dam and then it is allowed to pass through; otherwise the adjoining country would be flooded.

soon began the erection of low towers, on enclosed bays and straits to guide ships into harbors. Then it built higher and higher ones, on rocks and shoals some distance out from the mainland. With the invention of the Argand lamp in France, Army and Navy engineers were set to work to solve the problems of building lighthouses two hundred feet high, and strong enough to withstand the force of waves and tides and storm winds. Lamps and reflectors were enlarged and improved until warning rays could be sent to ships sixteen miles out at sea.

The Building of the Lighthouses

The number of shipwrecks near our coasts were reduced year after year. But when a vessel did go aground there was still loss of life. So, in 1871, the life saving service was established. A total of three hundred stations have now been strung along our ten thousand miles of ocean and lake shores, one for every thirty-three miles. They are all connected by telephone and telegraph, and coast guards patrol every mile, night and day. Provided with signals and with every means for reaching ships in distress, they save more than a thousand people from shipwreck every year.

Federal Aid for Schools

Education is one of the things that is thought by most people to

have been left wholly to the States. It is true that the Federal Constitution made no specific provision for education. But under that power "to promote the general welfare," it has encouraged education, made large contributions to it and influenced its character. It established and supports the military and naval academies. And when a public domain was created in the Northwest Territory, the government set aside one section or 640 acres of land, out of every township of sixteen sections, as an endowment for a public school. Two entire townships in each of the states of Ohio, Indiana, Illinois, Michigan, and Wisconsin were reserved for founding a state university.

This was the first time in history that public lands were donated to education, and it enormously stimulated the establishment of free public schools in old states and new. As the state universities of the West were built, the government made further donations of public lands. By 1889 its gifts to higher education amounted to twenty thousand square miles of land, worth five million dollars. Only with this generous aid could the universities of the middle and far western states have been so rapidly built up to rank with the old endowed universities of the East. And they set new standards. Supported directly by state taxes they were obliged to respond to the practical needs of the people. In order to hold their own in competition the colleges and universities of the East have had to change their methods and broaden their fields of work.

Public Lands for Public Schools

The government has, besides, established colleges of agriculture, mining and mechanical engineering in western territories, in advance of their admission as states. It has built and maintained schools on the Indian reservations, and Carlisle Indian College. Through the Freedman's Bureau it began the work of educating the Negroes, in reconstruction days in the South. It established the public school system of Cuba, Porto Rico and the Philippine Islands, and supports free schools for the children of employes in the Panama Canal Zone. Some day there will be a National University in Washington. Our first president recommended that it be built, in his message to Congress in 1796. While nothing has been done as yet, the project has not been forgotten. It is intended that this should be a post-graduate institution, where eminent scholars may have the free use of the national museums, libraries, and scientific departments of the government.

Uncle Sam as a Schoolmaster

Many kinds of welfare work, on a scale undreamed of by other equally progressive countries, have been possible in the United States because of the vast extent of our public domain. The purchase of Louisiana, and of territory owned by Spain, Mexico and Russia, gave to the Federal government, Alaska and all the land west of the Mississippi. Until settled and developed, this wilderness had no value. To encourage emigration westward, public lands have been sold to actual settlers for nominal prices, and the purchase money used for local improvements.

Land Grants to Railroads

By 1830 there were fifteen thousand miles of roads and canals in use in the Middle West that were built with federal aid. Then land

Indian Girls Learning to Sew

© *Underwood & Underwood*

This is one of the rooms in the famous Indian School at Carlisle, Pa., where Uncle Sam teaches his Indian wards how to become good and useful citizens. The girls you see here are all Indians and they are learning plain sewing.

grants were made to early railroads. For quite forty years every railroad that opened up a new region was a costly experiment. Without the help of the government the development of rapid transportation and the settlement of the Far West must long have been delayed. Before 1860 Congress had given to railroad companies an area of land larger than the original thirteen states. The largest grants of all were made to the Union and Central Pacific roads which connected San Francisco with the Missouri River at Omaha. Beside a cash bonus of $55,000,000, these roads were given every other section of land in a strip twenty miles wide on both sides of their nineteen hundred miles of track.

Much of this mountain and desert land had no value, but the mineral and timber tracts, fertile valleys and town sites have repaid the cost of the first transcontinental railroad many times over. This enormous grant was the last to be made to a railroad corporation. By 1870 population was increasing so rapidly that the people demanded that all the remaining public lands should be allotted to actual settlers, and as mining and timber claims.

Giving Homes to the People

The first homestead act was passed by Congress in 1862. This provided that any head of a family, or citizen over twenty-one years of age, could secure one hundred and sixty acres of land for a home. All he had to do was to file a claim with the government, live on the place for five years, pay fees amounting to a dollar and a quarter an acre, and make certain improvements in buildings, fences and the planting of crops.

Earning One of Uncle Sam's Farms

Under this law one hundred and three thousand "homesteaders" settled millions of acres of wild forest and prairie by 1870. Then western railroads opened their land grants to homesteaders at about twice the price of government land. As In-

Building the Railroad and Fighting Indians

This shows one of the ways in which Uncle Sam helped to build the Union Pacific Railroad. He not only helped the roads by land grants, but supplied soldiers who helped build the railroad, and also fought off the Indians as you see them doing here. The Indians were determined to rid their country of these men who were spoiling their hunting grounds and killing the buffalo for food. Most of the men who helped with this work were soldiers who had fought in the Civil War, and many whole companies together with their commanders went West for this purpose.

dian tribes diminished in numbers, their reservations in well settled states were exchanged for other lands where game was more plentiful. These, too, were opened to settlement as fast as they were acquired.

The Great Irrigation Works

Making the Desert Bring Forth

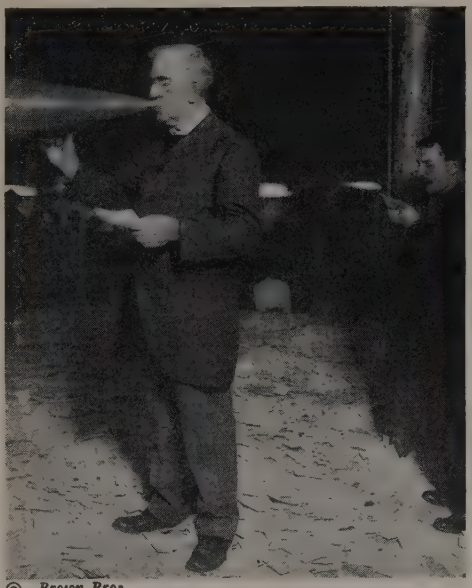
By 1890 most of the good public lands suitable for farming had been taken up. But on the dry plains and the mountain plateaus of the Far West, there were still one hundred million acres of dry land that needed only water to make them fertile. In the geography article on the Rocky Mountain States, we tell you how the government is reclaiming large tracts of this dry land by constructing great dams, tunnels, aqueducts over canyons, and networks of canals in irrigation works. The first project was not under way until 1902, but already two million acres of desert have been turned into green orchards, gardens, alfalfa and grain fields. In time there will be country homes here for ten million people. A charge of twenty-five dollars an acre is made for these lands, to return the cost of reclamation to the government. Settlers, however, are allowed ten years' time to complete the payments for their homesteads and for their share in irrigation works which farming

communities will own and control when these payments are completed.

Other Great Public Enterprises

In the same regions the government is saving the forests on the mountain slopes and other public lands. We have a special story about that in Pictured Knowledge. We also tell you of the many ways in which the United States Agricultural Department helps the farmer in his business. And in "The Harvest of the Sea" we explain the nation-wide systematic work of restocking the sea, rivers and lakes with food fishes. All this practical service is given freely, so the people can have more and better food, clothing, houses and furniture at less cost, and so the United States can support a greater number of people in comfort. To make trade easier and cheaper between the Atlantic and Pacific coasts the government dug the Panama Canal at a cost of hundreds of millions of dollars. It has laid ocean cables to our distant island possessions, strung telegraph wires all over Alaska, opened mail routes to the Arctic Ocean, and the building of the Central Alaska railroad means the opening up of the copper and coal mines and the good farming lands of the Yukon Valley and their connection with markets.

Announcing the Highest Bidder



© *Brown Bros.*

This is a scene at a sale of government land. One of the government officers is calling out the names of those to whom land has been sold because they are the highest bidders. He is speaking through a megaphone because there is a very large crowd present—the people who have sent in their bids. These bids must be in writing and a large number of them are sent in by mail as you can see by the envelopes all over the floor.

When the government has decided to open up lands for sale they make a list of them with their exact location and a brief description of the character of each piece of land. For instance, one piece is described as "smooth pasture land all tillable." Another, "rolling, rocky timber land," etc. Opposite the description of each piece is given the lowest price that will be accepted. Then the land is sold to the highest bidder. All bids must be in writing and accompanied by a certified check for the amount of the bid. All checks lower than the highest bid are returned.

Our country has a care, too, for things of interest and beauty, as well as the useful. It has reserved vast tracts of wild wonders in the national parks for public play grounds, and there it protects the native wild animals, birds and plants that are disappearing elsewhere. It has set aside natural monuments, historic battlegrounds, and prehistoric remains of the cliff and mound builders; and it has established winter refuges on islands along the Gulf Coast for our wild song birds. And our government secured the co-operation of Great Britain and Japan in the work of protecting the fur seal in their summer rookeries on Pribilof Islands. Every summer swift revenue cutters patrol

Behring Sea to stop the illegal hunting that threatened to exterminate these harmless fur-bearing animals.

Protection Against Disease

And do you know about the ceaseless vigilance of our government in protecting public health? The states and cities do all the local work in this field, but the authority of the United States extends three miles out at sea, all around our coasts. Ships used to come and go between our own and foreign seaports much as they pleased. They often brought in dreadful contagious diseases, and spread epidemics of smallpox and yellow fever. To close our harbors to ships from infected tropic ports interfered seriously with travel and trade; and this was unfair to vessels that were free from disease. So the government undertook to have health officers meet and inspect all incoming ships. No vessel is permitted to land goods, passengers or crews until it has been given a bill of health. Immigrants are landed first on Ellis Island, New York Harbor, and at similar receiving stations in other ports of entry; and the sick are isolated in hospitals until they are well again.

Rats are known to spread the bubonic plague, a dreadful contagious disease of Oriental countries, so the rodents are hunted out of docks, piers and warehouses. And they are prevented from coming ashore from ships by

A Homestead in the Timber

Here is a picturesque little place on the timber lands where the Government gives to those who comply with the conditions. These houses, unlike that of the woman homesteader of the prairie, were built of logs because there is plenty of material for such houses here, while the Dakota plains are treeless. You see the people here have made a good many improvements and, besides their picturesque little home, have a poultry yard and an additional building in the rear where they evidently do their washing, as you can see the clothes hanging on the line.

A Woman Homesteader's Home

Of course, a great many more men than women avail themselves of the homestead law to secure a farm from Uncle Sam. This picture shows the house a woman homesteader had built when she took up a piece of land in North Dakota. In spite of the fact that it is a lonesome place, she looks quite comfortable and content and is looking forward to the time when she will have a fine piece of land that is all her own, and besides she has women neighbors—although a good many miles away—who, like herself, have taken up claims.

When the Desert Gets a Drink

The very same mountains you see, the very same wide plains in both pictures—but what a difference. The first picture is a scene in the desert, for only sage brush and the toughest of desert grasses can get a foothold here and there. But the soil, nevertheless is very rich, and soon as irrigation has been applied, presto! up spring the fields of golden grain. Such heads of wheat! Notice how they bend down the straw by their weight. To the right across the field there is a big stack of wheat and not far away, no doubt, is a farm house and cattle where they have lots of good things to eat, and happy little children play in the sunshine.

stringing big, round, steel plates on the cables which tie vessels to their docks. The government cleaned up Havana, after the Spanish-American War, and stopped the epidemics of yellow, typhoid and typhus fevers which annually ravaged that semi-tropic city. It cleaned Panama and Colon, and made war on the malaria mosquito which infested the Canal Zone. Thus it gave to our states, cities, towns and farming communities valuable object lessons on the principles of sanitation. The entire country has learned the necessity for cleanliness, scientific sewage systems and pure drinking water; and the dangers to public health of dirt, cesspools, rats, flies and mosquitoes.

Government inspectors enforce sanitary laws in packing houses, bakeries, creameries, fruit, fish and vegetable canning factories; sugar, starch, flour and cereal mills—every kind of food manufactory that engages in interstate commerce. Federal pure food laws provide penalties against impurities and adulterations in food, and against the use of harmful preservatives and coloring matter. Local health authorities fol-

Lowering a Typhoid Sufferer from an Ocean Liner

This is a scene in New York harbor where an immigrant on one of the big ocean liners which has just arrived, is suffering from typhoid fever. The passenger will be taken to a public hospital and given attention until he is able to be about.

low this example and inspect dairy cows, milk, food markets and cold storage warehouses. And the lesson has been impressed upon housekeepers to keep their cellars, kitchens and refrigerators clean, to keep garbage cans covered and to exterminate the house fly.

Co-operation with Cities and States

Much of the welfare work of our government is educative. It is surprising to discover in how many ways, without interference with individual liberty or with state's rights, federal activities enter into the every day life of the people. It investigates everything that affects the general welfare, makes reports, recommends where it has no authority to act directly, and sets all sorts of helpful public work in motion. Sometimes, however, progressive cities and states lead the way with reforms, and the government follows and completes them. The states tried to regulate railroad freight and passenger rates, but endless confusion resulted with injustice to both the public and the owners of the roads. So the Federal Congress, having jurisdiction over interstate commerce, appointed a commission to fix rates.

Helping to Protect the Children

The cities and states, too, began the work of caring for the children. Education has gradually been made compulsory in almost all states. People are prosecuted for abusing or corrupting children, and the age at which they may be employed has been slowly raised until, in many

All Ready for the Rush

The keen-eyed young men you see in line back of the table, are all newspaper men, the Washington correspondents of as many papers throughout the country. They have in their hands the cotton census report and are ready to rush with it to the telegraph office as soon as the Government officials give the word. Information as to crop conditions is very carefully guarded by the Government until it is ready to give out, because these reports affect the market, and prices go up if the report indicates a crop yield less than was expected, so you see it wouldn't do to let one person get this information ahead of another.

states, it is now sixteen years. Public playgrounds and juvenile courts have been established in many cities; the authorities are especially watchful of the health of babies, and the states are maintaining state public schools and finding homes for orphaned and other dependent children. It was not until 1912, however, that the government established the Child Welfare Bureau, as a branch of the Department of Commerce and Labor. We have a little story in these books telling about the duties of this bureau. A Federal Child Labor Law was passed, but was declared unconstitutional. This interfered with no state law, but it would have released thousands of children from working in coal mines, cotton mills and canneries, simply by forbidding the shipment of goods produced by the aid of children in interstate commerce. Thus backward states would be brought in line with the most progressive in the proper treatment of their children.

Work Yet to Be Done

What next? No one knows, but it will be whatever the people want to have done. By reading the best newspapers and current events magazines, you will find discussions of many things that are advocated by various organizations. It is widely held that the government should take steps to Americanize the immigrants who are coming to us. Cities have opened night schools to educate them; and the function of the Immigration Officers might well be enlarged to help the newcomer to prosperity and useful citizenship.

Many people think that the government should continue the war-

time operation of the railroads and telegraph lines; and that it should undertake great engineering works to control the floods of the Ohio, Missouri and Mississippi rivers. And along the Atlantic and Gulf Coast, in Florida and on the lower Mississippi, are vast areas of swamp lands that could be reclaimed, by extensive drainage works which only a rich country could finance. There is a growing demand, too, that the water power, oil fields and mineral tracts on public lands should be reserved in the interests of all the people, as are the forests. And as the government helped the early railroads, it was thought by many that it should help build, or rather, rebuild, our merchant marine. The fact that our sea-borne commerce before the war was carried in the ships of other nations placed our foreign trade at a disadvantage.

The Famous Rat Catchers of Paris

The rat catchers of Paris are famous. They work in the sewers which run under the city everywhere and are the favorite haunts for these disease-spreading animals. So there are officials employed by the city as you can see by the official cap of the man in the picture. He is just going down into the manhole. One foot is resting on the rung of the iron ladder that is attached to the walls of the manhole. He has high hobnailed boots, because the bottom of the sewers are slippery with water and slime. The man behind him is holding the dark lantern and the bag in which he puts the rats. With this dark lantern he explores the walls of the sewers and when he sees a rat he grasps him by the back of the neck and whisk, he goes into the bag which is swung from his shoulder by a strap and the mouth kept closed. These rat catchers work in shifts day and night. Fifteen rats is a good night's work, while when he catches twenty-five, the rat catcher says he has had a "good luck night"—or day, as the case may be. The rat catcher has a peculiar whistle which for some reason calls the rats to come out; possibly out of curiosity. He also carries pockets full of white pebbles which he throws against the wall in such a way that they bound back toward him. This often makes the rats come out from their hiding place and when they see the pebbles they run toward them. Just why the rat does this is not known, but the rat catcher thinks it is because the rat imagines it is a piece of white sugar, for he calls it his "sugar trick."

It would be an interesting thing for your history class in school to think over and discuss the many ways in which the government might still further "promote the

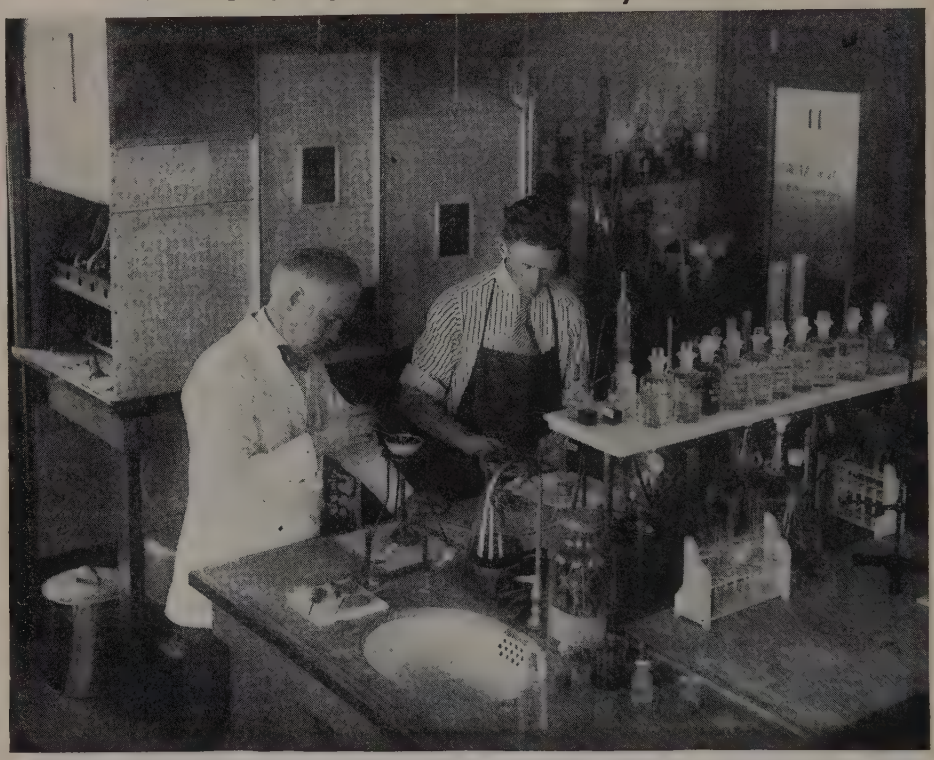
An Objectionable Passenger Who Is Not Allowed to Land

Because rats are carriers of disease germs which are collected in their fur, or because the rats are infested with disease-bearing fleas, the masters of vessels are required to attach disks like those shown in the picture, to the ropes with which their vessels are moored when they come into port. Mr. Rat can easily run along the rope but when he gets to this disk he can't get over. Farmers frequently carry out the same idea by putting tin hoods around the posts that hold up their corn cribs.

But while he is a very dangerous visitor when he comes from countries infested with plague, and native rats help spread contagious diseases, it must be entered to the credit of Mr. Rat that he also helps to prevent the spread of disease. How would you suppose? By eating waste food and decaying things which would otherwise pollute the air and help to cause fever. In the days before the disposal of waste and sewage had been reduced to the science it is today, the rat was of much importance in this respect.

Rats can and do make themselves at home everywhere. They never complain of the food or the poor quarters. They are found under the barn, under the house, in burrows under old walls, up in the attic, universal nuisances.

The Chemist and the "All-Day Suckers"



You know what an "all-day sucker" is don't you? It would be better for you if you didn't—that is to say, if you put them into your mouth. And I'll tell you why.

Prof. L. B. Allyn is here working with one of his pupils in chemistry in the High School laboratory in Westfield, Mass., and by the magic power of chemistry is making one of these "all-day suckers" tell what it is made of and he finds that it contains among other things, arsenic. At other times these candies and other cheap candies offered for sale are found to contain coal tar dye, to give them their attractive color. This dye may be attractive to look at but it is very bad for the stomach. Prof. Allyn became famous all over the country for the work he did in exposing the character of various foods and candies sold in stores, as represented by specimens brought by his pupils from the different stores in the town.

While we are here with him in his laboratory, the affair that looks something like a doll house with two windows just back of Prof. Allyn, is what is called a gas hood, because in it are put things from which poisonous gases would escape into the laboratory if the vessels containing them were not inclosed by this hood. The hood is connected with a ventilating shaft which carries the fumes away. Just inside the "front door" which is raised, are a row of flasks on a shelf which contain foods which are being examined to see how much nitrogen or protein they contain. Just beneath it, next to the can, you see the edge of an electrical whirling machine that separates things out of food. It works on the principle as the cream separator which separates the cream from the milk.

The painted glass in front of Prof. Allyn's assistant is an air extractor for taking fats and oils out of food products. Immediately below Prof. Allyn's right arm are three of those "all-day suckers" in the form of human hands, while in the jar just back of the wash basin is a jar of candy containing coal tar dyes. "If candy is properly made and properly used," says Prof. Allyn, "it is a valuable food product, but such candy as this is horrid and poisonous." Next to this jar is a cone-shaped flask which is warming on an electric stove.

To See if Bossy's Heart and Lungs Are All Right

Impure milk is one great cause of the spread of disease and many precautions must be taken by the health officers to protect the public against it. The milk may be impure because it has not been handled under cleanly conditions. Its impurity may also be due to some disease in the cow. The inspector here is listening to the lungs and heart of the cow, just as a physician listens to the workings of the human heart with a stethoscope. The sounds made by heart or lungs indicate certain diseases including consumption which affects cattle and some of the other lower animals just as it does human beings.

general welfare." This is, perhaps, the very largest power conferred by the Constitution. When you come to think of it, that power is limited only by the will of the people. Ideas change to suit the needs of new and changing times, and this is an age of progress when free people demand the highest social service from their governments.

Protecting Melons Against Flies

In the poorer districts of great cities where people cannot afford to buy a whole melon at a time, the melons are cut in half and sold from carts. Where they are not protected, flies gather on them and flies are bearers of disease germs. Here the woman is calling a fruit peddler's attention to the fact that he must keep his cut melons covered with netting.

Woman Inspector Destroying Bad Fruit

In seeing that the laws against the sale of bad food are carried out, a good many women inspectors are employed. This illustration shows a woman food inspector destroying a box of bad fruit that has been offered for sale on a street fruit-stand.

Inquiring into the Eggs

Here is the same inspector in a grocery store looking for bad eggs. You see she is breaking them into a dish. Grocers who persistently offer bad food for sale are subject to fine, and as a dishonest grocer never knows when the inspector will drop in, her visits tend to put him on his good behavior, or if he is merely careless, he goes more careful.

A Bombardment in the Battle of the Eggs

If you had been within hearing distance after this Deputy United States Marshal set those boxes on fire, you might have thought there was a battle going on, and indeed there was. It was a battle against bad eggs—over 89,000 of them. They all went off pretty close together like the crackers in a bunch in the time of the old-fashioned Fourth of July. The boxes of eggs were seized in the markets of Washington and were condemned by the Supreme Court of the District of Columbia, as being unfit for use. The flames caused the eggs to pop like pistols. The Deputy Marshal in the picture has just poured kerosene over the material for one of the numerous bonfires required to destroy these eggs, and will run away as fast as he can after he has applied the match.

Official Inspector Examining Barrels of Grapes

Here are a lot of barrels of grapes that have been shipped into a great city, and one of the food inspectors is emptying some of the barrels to see whether the grapes are in good condition.

What Is Done to the Bad Grapes

Out of all the barrels of grapes you saw in the previous picture, there were so many bad grapes in the barrels here shown that they have all been condemned, and the officer who showed you the bunch of decayed grapes is preparing to spray the barrels with crude petroleum, so that they cannot be offered for sale.

Using the Fire Engine on Disease Germs

Sometimes, as in this instance a fire engine is used to pump disinfectants into a disease-infected house. The scene here shown is in the poor quarters of one of the southern cities, in the days when yellow fever epidemics were not uncommon. Now-a-days, owing to the better sanitary conditions maintained by public authorities, such epidemics are unknown.

Killing Disease Germs with Sulphur

This is a house in which there has been contagious disease. The officers are burning sulphur to disinfect it. The men in the rear are repapering the walls as all the old paper has been torn off, because wall paper harbors a great many germs.

From the World Championship Hereford Herd

Herefords are beef animals as you will see by noticing their square, solid lines. The variety of grass crops which can be grown in winter as well as in summer in the South, thus greatly cutting down the cost of feeding them, makes the South an ideal locality for raising fine cattle. The owner of the cattle in the picture built up his herd of Herefords in about five years. When he exhibited them at the International Stock Show in Chicago they won the first price. These cattle are a living demonstration that tick eradication and leguminous crops pay the southern stock farmer big returns.

The Old South and the New

Southern Strawberries for Northern Markets

It is no uncommon thing nowadays to see delicious strawberries like these in northern grocery stores in March—three months before the home grown crop can be obtained. That is due to careful picking and improved methods of shipping, for some of the early berries in northern markets travel over a thousand miles—from Florida, Louisiana and California. These berries are as clean as they can be made without washing them, which would make them spoil, for dirty, wet berries decay more quickly than clean, dry ones. And see how carefully they are packed in the boxes, not jammed in just as they happen to fall, but laid in even rows. Whole districts in the South are devoted to the raising of strawberries for northern markets and it is the careful handling which makes our early spring supply possible. And the southern strawberry farmer can soon lay by a tidy sum; for it is the early strawberry that catches the best price.

AT the beginning of the Civil War thirty-four states had been admitted to the Union. The twenty-three fighting for the Union had a population of twenty-two million, out of a total of thirty-one million for the entire country. In the eleven states that seceded—Arkansas, Tennessee and the coast states from Virginia to Texas—there were only nine million people. Of these, three and a half million were Negro slaves, who were not used for soldiers. Thus the South was outnumbered nearly four to one. The only wonder is that it should have taken four years to conquer the Confederacy. To account for it we shall have to consider the advantages and disadvantages of both sides.

Difference Between the North and the South

In the North all the people were free, and fully ninety-five per cent of them were of the white

The Texas Steer

Stories of lawless cowboy days out West are full of accounts of the round-up, lassoing and branding cattle, and so forth. The Texas steer shown here is a sample of the breed that wandered over the western ranges fifty years ago and was rounded up, counted and branded only twice a year. As the density of population increases in the western and southern states, fewer and better cattle are kept, but they are fed regularly or kept in fenced pastures and are bred up to a certain standard for their meat or milk-giving qualities. Like the razorback hog, the Texas steer is small, swift, and bony. His horns are formidable weapons of defense, as you see. With the introduction of the dipping vat for eliminating cattle ticks, the South is forbidding the keeping of cattle on open range, and the picturesque Texas steer will soon be extinct for he is a nondescript and cannot hold his own in competition with the purebred Holstein or Hereford. He is profitable only when his food costs nothing at all, not even the labor of giving it to him. This one is kept in the Wichita National Forest, Oklahoma.

race, of every energetic and industrious nationality of northern Europe. Here, where every man took pride in working with his hands and brain, were the manufacturing cities, the successful business men, the skilled mechanics and inventors, the most varied farm products, the iron and coal mines, the shipyards and hardy seamen, and the highly developed systems of transportation. As Napoleon said, an army "travels on its stomach." Soldiers must be well fed, well cared for in camp and hospital, and liberally supplied with munitions of war, if they are to do their work. These conditions of success attended the Union armies. Behind them crops were grown and harvested throughout the war, without interruption. Flour, cotton, woolen and steel mills, packing houses, clothing factories, machine shops, chemical, munition and gun works, coal mines, blast furnaces, railroads and shipyards were in constant operation. No property was destroyed, nor the lives of civilians in danger, for only one great battle—Gettysburg—was fought on northern soil, above Maryland, Kentucky and Missouri.

Great Advantages of the North

The North was more than self-sustaining. It had a large surplus of wheat and other products to sell abroad. The seaports were open to trade, commerce was only spasmodically interrupted by Confederate raiders, and the credit of the national government was maintained in every foreign capital. Although conscription was resorted to, less than half the men of military age and fitness were drafted into the army. Plenty were left at home to conduct the greatly increased business of the nation, and also to work on the Union Pacific and other new railroads. The chief disadvantages of the federal government, in the early years of the war, was that it

was unprepared, and the people were divided. There were men of every shade of opinion, from Abolitionists to those who openly sympathized with the South. There were farmer boys in the army, but a large percentage of the soldiers were city clerks and mechanics. These were untrained, unused to out-of-door life and to the handling of horses and firearms.

Conditions in the South

Now let us consider conditions in the South. The region was purely agricultural, but limited to a few large crops that were grown for exportation. The southern states had enormous wealth in their cotton, rice, sugar and tobacco, and in the naval stores yielded by the pine forests. They produced one-fourth of the corn crop of the country, but this, with the other grains and forage, was consumed at home, by the slaves, the necessary farm animals, and by the many riding and driving horses that were kept for pleasure.

Not a Manufacturing Section

The South grew only a part of its food, and imported all the clothing for its population. Many planters found it more profitable to put all their land in cotton, the big money crop, and to buy the pork, meal and molasses, as well as the coarse cotton cloth, that was needed to feed and clothe their negro field hands. Clothing, furniture and books, building materials, carriages and wagons, locomotives, rails and cars, telegraph wire, steamboats and machinery, farm and building tools, saddles and harness, even horseshoes, nails and salt, were purchased in northern markets or abroad.

This made the South dependent on the outside world for almost every necessity. In the entire region there were no coal or iron mines in operation, no blast furnaces, and only 20,000 miles of railroads. There were neither manufacturing cities nor the small factory towns that were so numerous in the North, and consequently, few skilled mechanics. There were cotton gins at the shipping points, and small saw and gristmills, to supply local needs; but the necessary blacksmithing, carpenter work, brick laying and shoe and harness mending was done by negroes in plantation or village craft shops. The most serious defect of slavery was to make white men look down upon manual labor. Very few had great wealth or desired it. The independence and agreeable leisure secured by land and unpaid labor made men despise trade. Life was little changed from the time of Washington. Planters lived like the country gentry of England, managing their great estates and cultivating their minds and the social graces. Younger sons studied for the professions or the army, or went into politics.

The South's Military Advantages

Thus industrially and economically the South was hopelessly handicapped in the great war. Trade with the northern states was stopped at once, and immediate steps were taken to blockade the southern coast and capture the ports, in order to cut off trade with foreign countries. But in a military way the Confederate States were much better equipped than was the Union, in the first two years of the war. For one thing, they were "solid." The white people were all of old colonial stock, united in political opinions, feelings and interests. Then, all southern

men lived in the open. They spent their lives in walking, riding and hunting, and were skilled in the use of firearms. Besides, they were in their own country—knew every wood and stream and wild path in it. And they fought on the defensive. Nothing can equal the courage, determination, endurance and resource of men who fight to defend their families and homes against the invader. For three years Lee held the army of the Potomac in Maryland and northern Virginia; and for more than two years the forces in the West were kept as far north as Tennessee.

In the beginning the South was much better prepared for the war than the North. As fast as the states seceded they seized the government arsenals and the forts within their borders, and the state legislatures made large appropriations for the purchase of guns and munitions abroad. Although Virginia did not secede until after President Lincoln issued the call for volunteers, it secured more than $10,000,000 worth of powder, balls, cannon and ships from the arsenal at Harper's Ferry and the Norfolk Navy Yard. When these supplies were exhausted, however, the South could get only what the blockade runners could manage to smuggle in.

Then Came the Time of Suffering

The people suffered immediate distress in every comfort of living. The crops could not be sold, and money gradually disappeared. There was merchandise in the stores for only one season. The clothing of women, children and negroes could be made to last a long time, but the soldiers, in their rough campaigning, soon wore out their uniforms and were reduced to makeshifts.

Back to Pioneer Conditions

Then women, unused to toil, had to begin home manufacturing with the crudest materials and tools. They learned to spin and weave on old colonial wheels and looms, brought down from garrets. They dyed their cloth with walnut hulls, indigo and swamp-maple bark. They roasted rye and wheat for coffee. And the men had to learn to mend the old muskets, rifles and shotguns that were pressed into use. Iron and steel of every description was gathered up, even fire pokers and hoes, and beaten into horseshoes and bayonets. Boxes and barrels, used in packing meat and fish, were soaked in water for the salt. With baled cotton rotting on decaying docks, curtains and bedding were made up into dresses for women and shirts for soldiers.

While the Union used only half its military strength, nine-tenths of all the white men between sixteen and sixty in the South were drafted into the Confederate army. And so that every soldier should count as a fighting unit, the camp cooking, team-driving, trench-digging, and the work on fortifications, was done by Negroes drawn from the fields. Only women, children and old men, black and white, were left at home, and the horses and cattle were taken for the army. The fields grew up to weeds. Fences fell, buildings decayed from neglect, business stopped and railroads were ruined for lack of repairs and coal. In the last year of the war the weight of twenty-three states fell on seven.

The work of ruin was completed when Union armies rolled across Georgia and Virginia, and emancipated slaves deserted the last camps and fields. Property of every

"Before and After" the Demonstrator Came

Since such a large part of southern agricultural land is cultivated by Negro farmers, it is very important that the Negroes learn how to farm efficiently. The pictures show the effect of a few lessons from the government demonstrator on a Negro's home and dooryard. Many of the demonstrators are themselves Negroes working under white supervision. In one Alabama community

the Negroes have formed a club, which requires every member to have an enclosed garden in which something is growing the year around; to keep one hog for each member of his family, not less than thirty hens, and one or more cows; to preserve or can fruits enough to last over the winter; to plant shrubs, whitewash the house and take an agricultural paper. Such movements among the Negroes themselves will do away with the time-honored charge of shiftlessness laid at the Negro's door.

description was destroyed wherever retreating or invading armies passed. Hundreds of miles of railroad were torn up and the bridges and ties burned. Of the South's million soldiers, three hundred thousand were dead or disabled. Those who survived returned to reduced families, in homes of desolation, to face starvation. The farm lands were laid waste, and there was no machinery to cultivate them, no seed for planting. Live stock had disappeared.

In the Desolated Land

The Period of Reconstruction

Your history tells you of the "Reconstruction" period. This refers to the work of restoring the civil government, the readmission of the seceded states to the Union, and the securing to the freedmen of their new rights of citizenship. The work was not completed for ten years, and it was not done in the wisest, kindest ways. Never was Lincoln, "with malice toward none and charity for all," so much needed at the helm of state as in the years which followed the close of the war. Officials of the federal government, sent from the northern states, were long in control in the South—a political army of occupation in a conquered and devastated land. Then was an era of "carpet-bag" and Negro domination, of oppression and robbery; then another of revolt and terrorism on the part of the organized white population. Socially, industrially and politically the South was demoralized for a decade. Southerners speak of this period today as the "Era of Destruction."

For quite ten years the South steadily lost ground. Its property value of twelve billion in 1860, dropped to three billion by 1870. The Negroes, very little exposed to the perils of war, had increased to four million, which was then more than half the total population. Uneducated and unused to responsibility, many of them became idle and shiftless, or so helpless without direction, that they were as dependent as in the days of slavery.

Upon the white owners of ruined properties was laid the burden of restoring the neglected soil, rebuilding what had been destroyed, paying the excessive taxes of corrupt government, adjusting their agricultural industries to new conditions of paid but undisciplined labor, and supporting the dependents of both races. So great was the poverty and wretchedness of the land that two and a half million people were forced to emigrate to northern or western states. Those who left were mostly the strong and ambitious young people, white and black. By 1875 the population had declined to seven million, and the property value to one-fourth of what it had been fifteen years before, while the northern states were increasing in wealth and numbers at an incredible rate.

Under a Fearful Burden

In the School of Misfortune

Many people predicted that the South could never rise again. But one of the most inspiring things in history is to discover how the greatest of all countries have been built by people who have struggled up against overwhelming odds. Such people as the people of the South are not crushed, but strengthened, by misfortunes and hardships. The city of Venice, "Queen of the Adriatic," and ruler of a mighty republic of the Middle Ages, was built by a

The Razorback and the Thoroughbred

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These two pictures of the "razorback" and the thoroughbred hog may well typify the difference between the farming methods of the Old South and the New.

The razorback or "piney woods" pig is the native semi-wild hog of the South. Allowed the run of the woods and fields, and seldom fed at the home barnyard, these animals have developed long, burrowing snouts and rangy legs which are capable of out-distancing the average dog. The razor-

© Ginn & Co.

back is usually left to forage for a living, so he hasn't acquired the fat-producing power of the more thoroughly domesticated hog and has remained muscular and bony like a wild boar, the ancestor of the swine family. Contrast the relative size of bone and amount of fat in the two animals shown here. The larger animal is a Chesterwhite, one of the best-known lard types of hogs.

Where Your Rice Pudding Starts

Louisiana has many acres of ideal rice land—low, moist, and rich—and it produces more rice than any other state. It now has almost 350,000 acres of rice. The picture shows you how it is cultivated—in high, ridged rows. Notice the reed-like character of the leaves, which is typical of plants that grow in very wet soil.

band of wretched fugitives on a cluster of marshy islands. And the Dutch spread their fields of bloom on barren sand dunes, which they walled from the sea. So the people of the southern states, through disaster, found in themselves powers which they had never used nor dreamed that they possessed.

The first and most important result of the disappearance of slavery was the breaking down of the prejudice against manual work in the white people. "Gentlemen," obliged to care for their families, put their skilful hands and trained minds to the hardest tasks, and slowly repaired their broken fortunes. With no money or credit to operate large plantations, many of the big estates were cut up into small farms. These were sold to poor whites, who had never been able to own anything before; or rented to former slaves, who paid crop rent and worked their little holdings under the supervision of the owners. And, as every family was obliged to supply its own necessities as largely as possible, land was used to its full advantage. Crops became more diversified. Every negro cabin had its garden, its working mule, its cow, pigs and chickens. Waste lands were cleared and drained. Educated men very quickly became good carpenters, coopers, brickmakers, stock breeders, engineers and machinists. Saw and grist-mills multiplied, rice and sugar culture was extended, and modern farm and mill machinery and improved methods were introduced.

The Great Lesson of Labor

At the End of Twenty Years

By 1880, the South, while buying much less than in the old, lavish, wasteful days, was living in comfort and growing as much cotton and other export crops as in 1860. The

The Hidden Treasure in the Peanut Field

Southern farmers who have grown the same crop on the same land, year after year, are learning that changing the crops from year to year makes the land yield more and better crops. The picture shows a thriving field of peanuts in Oklahoma. Peanuts, like clover and cow peas, form little "nitrogen factories" in their roots and hence add fertility to the soil.

cities, docks and railroads had been rebuilt, emigration had stopped, and the white population was growing. As soon as a little spare capital was accumulated a few small cotton-mills were built at waterfalls, to supply the home market with the coarse cloth needed by field laborers.

This was, indeed, the only way in which the larger industrial development of the South could have been begun. The bitter animosities engendered by the war were long in dying out, and it was useless to try to borrow capital in rich northern cities, where sympathy was still all for the freedman.

But this feeling had become helpful in solving the labor problems of the South, to which skilled white workingmen refused to emigrate. The South was obliged to educate its mechanics. Benevolent organizations of the North had, at first, been emotional and harmful to the black race. Negroes had been educated for the professions in which the openings for them were few. Now, education was aimed toward fitting the Negro into the great world of industry. Hampton Institute was established in Virginia, and its colored graduates went out as teachers among their own people. The most famous of these was Booker T. Washington, who, born in slavery, built up, almost unaided, the great Tuskegee Institute in Alabama. There, today, negro men and women are taught farming, housekeeping and the skilled trades. Its graduates are doing an important part in uplifting their race, and in building up the New South. One of the most interesting and inspiring autobiographies ever written is Washington's "Up From Slavery."

Education of the Negro

Aside from the unfriendly feeling caused by the war, northern

"New South" Farmer Girl in the Tomato Patch

Tomatoes are one of the chief crops of the truck farmers of the South. The girls' canning clubs which have been organized along the lines of the boys' corn clubs, teach the farmer's daughter to grow and can tomatoes for the market. This picture shows an energetic girl of the South at work in one of the southern fields after a bumper tomato crop.

manufacturers had, since the earliest colonial times, looked upon the agricultural South as their market; and they honestly doubted if southern men had the energy and ability to build and manage factories and to sell their product. History, you see, is an endless and complicated story of causes and their logical effects on every human activity. The South had to overcome, not only hostility, but its own reputation for lack of enterprise and practical capacity.

There was, however, by this time, not a little generous recognition of the heroic labors of southern men, who, with no outside help, were building a new and better prosperity on the ruins of the old. And a few men of clear vision, in both sections, realized that the development of varied industries in the South would not only enrich the whole nation, but that it was necessary for the rebirth of that spirit of national patriotism and indissoluble union, for which the war had been fought.

Then the Situation Changed

Then, suddenly, the whole situation was changed. About 1885 the northern and western states began to fill up so rapidly that it was plain that the powers of all the people, and the resources of all sections, must soon be taxed to supply the needs of the population and to keep pace with foreign markets. A new generation having grown up, with no memories of the war, northern men began to seek opportunities for profitable investment in the South. Gradually the vast, unsuspected natural resources of the states that had formed

Northern Capital Comes in

What This Little Boy Taught His Father

The boys' corn club movement has taught backward, uninformed farmers that the government methods achieve results; it has driven home the lesson to the farmers in the most effective way—that of being beaten at their own game by their children. Under the direction of the government

demonstrator, many boys have produced crops several times bigger and better in quality than those raised by their fathers on adjoining acres of the same farm. One of these pictures shows a boy standing between the rows of his demonstration corn crop and the other shows him in a field of corn raised the same year on the same farm by a tenant farmer.

Putting the Early Vegetables to Bed

Truck gardening is intensive farming. No steam tractor plows and gasoline seed distributors can be used here, for the acreage is small and each plant has to be put through many careful operations to gain the best results. After the seeds for most truck garden vegetables are in the ground the soil is worked over by hand, as you see the two men doing here. Because truck farming is usually done on a small scale the greatest pains must be taken to get the most money possible out of the space available. That is why the farmers bend every effort toward making their vegetables mature early, before the market is oversupplied.

the Confederacy, or lain on its borders, were uncovered.

What was it that men looked for? What is it that makes countries rich and populous? Just a few fundamental things alone or in different combinations— iron and other useful minerals, oil and coal and a fertile soil, water-power and a good location—on the great highways of trade, a favorable climate, which affects the energy of people.

Foundations of Natural Wealth

The wealth and power of England are due to her coal and iron mines, and to the cotton and other raw materials which her merchant fleets bring to her mills from every part of the world. New England, with nothing but a favorable location, timber for shipbuilding, and abundant water-power, was built up on the ease with which cotton, wool, leather, pig iron and coal could be brought to her factory doors and railroads, and finished products distributed to the markets of the world. Pennsylvania found riches in its extensive coal fields, and in the cheap water transportation for the iron ore of the Lake Superior region, to keep its blast furnaces going. The wealth of some of our states rests on the products of the soil—wheat, cattle or cotton.

After the invention of the cotton gin, the southern states produced a large percentage of all the raw cotton in the markets of Europe and America. Their crops were so valuable that every other source of wealth was neglected, and they suffered from other disadvantages. An enervating climate and slave labor made the best part of the population indolent. But after the war white men of education and property were obliged to go to work, and their am-

Where the Cane Juice Is Turned to Sugar

This is a picture of a sugar mill in the South, surrounded by fields of sugar cane. You see the cane has been cut and the men are stacking it up, but because the cane is so coarse and not easily stacked like wheat, stakes driven into the ground form an inclosure for it. The cane is growing in rich swamp land which has been drained. Notice how level the ground is.

bition was aroused; they began to consider in what other profitable ways, besides farming, they could use their energies and the little spare capital that they began to accumulate. The most obvious thing to do was to work up some of their raw cotton at home.

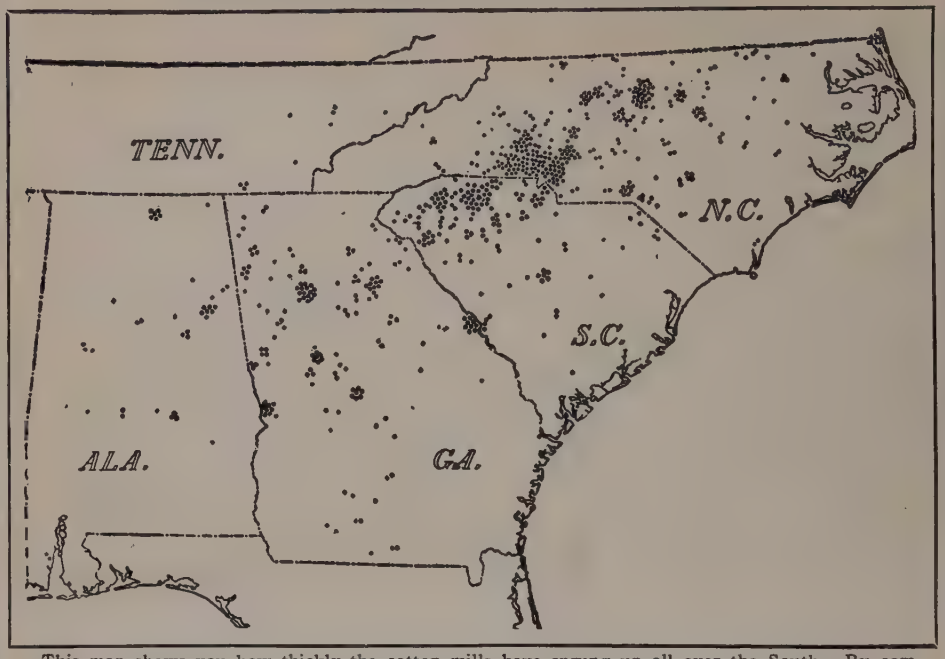
Beginning of the New South

The Fall Line and the Cotton Mills

As an experiment a few cotton mills were built at the waterfalls that, just as in the middle states, were formed in every stream where it dropped from the piedmont belt to the coastal plain. This is the famous "Fall Line," which runs midway between the mountains and the sea, from New Jersey to Alabama, and around the southern end of the Alleghenies. You can trace it on your map through Roanoke, Raleigh, Columbia, Macon and Montgomery. Descending from a region of rough foothills, that had never been cleared of their heavy growth of pine and hardwood forests, these falls had never turned any wheels. There was a second line below these, too, for the piedmont belt, with the coastal plain, widens toward the South, and the land drops again when you find Spartansburg, Charlotte, Atlanta and Birmingham.

All of these places are, today, factory cities, as busy and noisy as the mill towns of New England. Lumber-mills were built also, to work up the timber. Then followed furniture and tobacco factories, and the cut over lands of the richest virgin soil were soon cleared for market garden and fruit farms, to supply nearby towns and the markets of northern cities. Then, to the amaze-

Each Dot Stands for a Cotton Mill



This map shows you how thickly the cotton mills have sprung up all over the South. By comparing it with the map showing the cotton regions in the article on the Southern States, you will see that most of these mills are located on the edge of the regions in which most cotton is grown, with the exception of the cotton regions in Texas. Then, if you will remember the location of the Fall Line, you will understand why Texas is not shown on this map.

ment and delight of the South, the whole western slope of the mountains, was discovered to be underlaid with coal. In West Virginia, eastern Kentucky and Tennessee and northern Alabama, sixty thousand square miles of coal lands were surveyed—five times the total area of England and Germany, and the coal lay in so many deep and continuous veins that it is estimated to contain 5,000 tons of fuel to the surface acre.

And Such Beds of Coal and Iron!

This was discovered just as some other great coal fields of the world were beginning to decline in their output; and enormous deposits of iron ore were found in Tennessee and Alabama, about the time it began to appear that the iron mines of the Lake Superior region were not inexhaustible. So, there, at the southern end of the long Appalachian Highlands, where coal, iron and the limestone for purifying the ore in blast furnaces, occurred in vast quantities and in close proximity, stands Birmingham, the Pittsburgh of the New South, destined to be one of the greatest steel centers in the world.

The People of the Mountains

High up on both slopes was found still another source of wealth—the forgotten people of the mountain farms. Too poor to own lands or slaves in the tidewater region, in early days, they had gone to these wild uplands, and cleared and tilled their own rough acres. Many of the dauntless breed of Daniel Boone had started for the valleys of Kentucky or Tennessee, but had been stranded

Inside One of the Big Cotton Mills

Here we are inside one of the big cotton mills of the South. We see thousands of bobbins wound with the cotton threads that are afterwards to be woven into cloth. These bobbins are placed on machines called speeders which twist the fibers into yarn. There are two kinds of spinning machines: one is called the "ring spinner," the other "the mule." (Who would think of finding a mule in a cotton mill!) The mule winds the thread onto spools called cops, from which it is rewound on bobbins, long rows of which we see before us here. The bobbins are afterward arranged on frames from which the threads are passed into the warping machine which forms the "warp" across which the "weft" or cross threads are woven later, so making the cloth.

by accidents in the mountains. There they had lived like the earliest pioneers for quite a hundred years, and grown strong and hardy on toil, simple living and the pure, bracing air.

Some one has called these people our "contemporary ancestors." Certainly there is in them the best blood and highest courage of the seaboard colonies, and they have lost nothing in mental vigor by standing still for a century. Grasping the first opportunity to escape from their long exile from civilized communities, they eagerly flocked down into the foothills to work in the new lumber camps, mills and mines. It would be difficult to overestimate their value. Without this new source of superior labor, the South could never have been developed so rapidly. White emigrants have never been attracted to this section; and the negroes of the warm, moist coast do not thrive in the cool, dry mountains; and they are, besides, needed in the spreading fields of cotton, sugar and rice, and in the skilled trades in growing cities and towns.

New Source of Brains and Vigor

Many of these mountain men, too, while rude and unlettered, had a quick grasp and native shrewdness. Refusing to sell their valuable timber and mineral lands, they permitted them to be worked under leases on a royalty basis. They used their big incomes to educate their children; and the second generation returned to manage their own mines and mills, and to enrich the South

by making use of their native ability, energy and capital.

In broad diversification of manufacturing, and in making the finer finished goods, the South is still, of course, far behind the northern states and western Europe. But it has unlimited quantities of the most essential raw materials—coal, water-power, oil, iron, timber and cotton. And it has made long strides in the production of coal, coke, pig iron, bar steel, crude petroleum, lumber, and the coarser grades of cotton cloth; in opening its fine quarries of building stone, granite and marble, and in developing its beds of phosphate. Side by side with this has gone the extension of the acreage and improvement of methods in cultivating the big export crops, and in truck gardening and fruit growing. Population and construction work have kept pace with the growing industries.

In 1875 the South had only seven million people, while the Japanese Empire, which is smaller than Texas alone, supports fifty million. Within forty years the population of the South has increased to nearly thirty million. Its wealth of three billion has been swelled to over thirty-seven billion. The capital invested in cotton mills in thirty years has multiplied tenfold, and so has the production of iron. The railroads have been rebuilt and re-equipped, and have trebled in mileage. The big export crops have jumped from a value of $650,000,000 to nearly $2,000,000,000, of which one-third is for cotton. The lumber trade reaches the total of $250,000,000 a year, besides what is used in home furniture factories and in making packing cases. The oil fields of Texas rank among the greatest in the world. Texas and Oklahoma grow enormous crops of wheat; and as the western ranges disappear, it is to their ranches, and to the rough pasture lands of the southern states that we are beginning to look for future supplies of beef cattle.

Some Striking Figures

This rapid, many-sided development has made the most extraordinary changes

A Business Street in Birmingham

This scene on a business street of the great and prosperous city of Birmingham, Ala., will give you an idea of the growth of the cities of the New South since their rich natural resources began to be developed.

Freight Yards at Nashville

This picture of railroad yards in Nashville illustrates how the growth of industry and the development of railroads in the South have gone hand in hand. Nashville, as you know, is built on hills and bluffs overlooking the Cumberland. The railroads follow the low river banks.

The South as It Was

in the appearance of the whole country. Before the war the population was thin and scattered, and agriculture was the only industry. The coast lands and rich river bottoms alone were thickly settled and highly cultivated. Certain favored districts were taken up with big plantations, each with its fine old colonial mansion, its own wharf, negro quarters and craft shops. Poor whites, who owned few or no slaves, occupied the less desirable lands, and never prospered. The only towns were stagnant villages, the county-seats or "Courthouses," and the state capitals and seaports, that were social and political centers. These were reached by leisurely steamboats, or by slow trains, that rumbled over rusty, narrow-gauge railroads. The local travel of the wealthy was done in elegant carriages or on horseback; and carts, drawn by mules, were the means of locomotion and trade used by poor whites and Negroes. By far the larger part of the country was in pine forests, cypress swamps, canebrakes and sand barrens, and in unexplored, wooded mountains, whose wealth in timber, waterpower, minerals and vigorous people was unsuspected.

The South as It Is Today

Now the coast is a country of gardens and orchards, cotton, rice and sugar fields, and of winter resorts which vie with those of southern California in beauty and luxury. The piedmont belt is another region where a ribbon of truck and fruit farms lies between the hardwood forests of the higher slopes, and the factory cities of the Fall Line. Modern railroads skirt the coast, run along the foothills, come down the

Louisiana's "Little Italy"

In the strawberry raising and truck-farming section of Louisiana, near Independence, large colonies of Italian immigrants have settled. They are thriftier than colored people and soon have all their land under cultivation and their little farms paid for. The Illinois Central, which runs through Independence, has built this fine depot to keep pace with the prosperity of the inhabitants.

old Shenandoah Valley, which Lee's armies used for a wild highway, and connect the Ohio River and Great Lakes with the Gulf. Steamboats ply on the tidewater rivers, and coastwise trading vessels touch at countless little harbors all the way from Baltimore to Galveston. From the seaport cities one can go in the finest ocean steamers to Panama, the West Indies, Europe and South America.

To most people it is surprising to hear that New Orleans ranks second among the seaports of the United States in the bulk and value of its export trade, although five other ports exceed it in population. And Galveston, Texas, ranks third, with its enormous exports of cotton, wheat, rice, lumber, oil and the cattle of the Southwest. For hundreds of miles along that coast there is no other harbor. It is the converging point for nine railroads and fifty-three lines of ocean steamers. That is why it had to be rebuilt and protected by seventeen miles of concrete sea wall, after it was destroyed by a tidal wave and hurricane in 1900.

Great Business of the Ports

Probably no other city of equal size in the United States is so interesting from the standpoint of civic life as Galveston. Not only did it set an example to all cities in the astonishing rapidity with which it rose in new material strength from its great disaster, but in moral strength and efficiency in inaugurating a new era in the life of cities. It established what is widely known

The Old and the New in Southern Schools

The improvement in school conditions in the South and the great need for improvement is well illustrated in this and the following picture. Many southern children still get their education in a one-room country school of the type of the "Old Unity School." Untidiness, disorder, and dilapidation are to be found at the school, as well as in the homes of the poorer class of rural southern children. Add to these conditions the fact that in many of the rural schools the session

lasts for only five months or less, instead of nine as it does in the North, and that the teachers are too overworked and inexperienced to cope with their manifold difficulties, and you will understand something of the South's educational problem. The public school systems of the southern states are not thoroughly organized and are corrupted by politics. Money for the improvement of schools and the payment of a sufficient number of trained teachers is often lacking, so that whatever improvements are made must come from the localities themselves.

A School House of the New South

Yazoo City, Mississippi, is typical of the new spirit which animates the South. Mississippi used to be known as one of the most backward of southern states, with her large proportion of illiterate Negroes, sparse population and large areas of undeveloped land. But these conditions are changing, and Yazoo City is only one of the Mississippi towns that is waking up to a realization of the vast wealth they possess in their rich, black soil and long growing season. Yazoo City is a wide-awake, enterprising community as this fine schoolhouse shows. Notice the "dental work" that has been done on the trees near the school building. If you do not know how and why trees are treated in this way, read about it in the article on Forestry.

and practiced as the "commission" form of government or the "Galveston plan." By legislative act the ordinary method of government by mayor and council was abolished and instead there was created a board of commissioners, one member of which is president and all are elected by popular vote. One commissioner, a banker, with an expert accountant as city auditor under him, looks after the city's finances and in a similar way each department of the city's business is attended to by clean, able business men and experts. You see in this way the business of running a city is looked after just as any other business enterprise would be, instead of being regarded as one of the perquisites of party victory and given to men for their service to the party rather than their ability and desire to serve the public. Galveston exports one-third of all the American wheat that is shipped abroad; Gulfport, Mississippi, leads in lumber shipments, and Mobile in bridge timbers and railroad ties.

Like a Work of Magic

It is a New South, in truth—sprung up like magic, in the course of one generation. The bitter memories of the war are dying out. As we have seen, North and South joined in celebrating the centenary of the birth of General Lee. Old soldiers in blue and gray, clasp hands on the battlefields of a half century ago; decorate the graves of each other's dead, and exchange captured flags and cannon. Thou-

sands of southerners, white and black, are now living happily in the North, and northern people are finding new homes and opportunities in Dixie.

The old South is gone, and no one would have it back again. But its gracious memory is cherished in song and story; and the best of it survives in the gentle manners, and in the leisure for culture and hospitality in old southern families.

A Southern Hostess and Her Dinner Guests

Things "come easy" in the South, and that is probably one reason why this part of our country is only now beginning to realize its possibilities. The northern farmer has been developing prize milk and beef cattle by feeding them in the barn seven months in the year, while in the South they can be kept out of doors on green, instead of dry, food the year around. The result is that better calves can be raised in the South for about half what it costs to raise them in the North, and here is one of the farms on which they are doing it. The little girl in the picture is presiding over the dinner table of a small herd of young Louisiana Jerseys which are all her own.

To a Waterfowl

Whither, midst falling dew,
While glow the heavens with the last steps of day,
Far, through their rosy depths, dost thou pursue
Thy solitary way?

Vainly the fowler's eye
Might mark thy distant flight to do thee wrong,
As, darkly painted on the crimson sky,
Thy figure floats along.

Seek'st thou the splashy brink
Of weedy lake, or marge of river wide,
Or where the rocking billows rise and sink
On the chafed ocean-side?

There is a Power whose care
Teaches thy way along that pathless coast—
The desert and illimitable air—
Lone wandering, but not lost.

All day thy wings have fanned,
At that far height, the cold, thin atmosphere,
Yet stoop not, weary, to the welcome land,
Though the dark night is near.

And soon that toil shall end;
Soon shalt thou find a summer home and rest,
And scream among thy fellows; reeds shall bend
Soon o'er thy sheltered nest.

Thou'rt gone, the abyss of heaven
Hath swallowed up thy form; yet, on my heart
Deeply hath sunk the lesson thou has given,
And shall not soon depart.

He who, from zone to zone,
Guides through the boundless sky thy certain flight
In the long way that I must tread alone,
Will lead my step aright.

WILLIAM CULLEN BRYANT

Little Journeys to Historical Places

Plymouth Rock in Its Shrine

"The chief object of interest here is the granite boulder used by the exiles as a stepping stone from their row boats to the bleak shore of the New World. It lies today where it laid 300 years ago, on the edge of the water of a small bay that is still a harbor for fishermen. But the rock is sheltered now under the stone canopy of a small classic temple."

BEFORE the great European War of 1914, most Americans who had money and leisure for travel, turned their backs on the United States and went to Europe. It is true that our country is new and crude. We have nothing like the ancient cities, palaces, castles and cathedrals of the Old World. We cannot match its galleries filled with long accumulations of art; its buried cities, temples and sculptures that have been unearthed; its picturesque ruins, nor the quaint hamlets and national dress that are parts of a storied past. And we very rightfully have a feeling of ownership in everything that has been preserved in the countries of our ancestry, for our forefathers had a hand in making and keeping whatever is cherished there today.

Seeing America First

Our mistake was in thinking that America has little of historic interest that is worthy of our love and pride. Then the war, by stopping tourist trips abroad, sent us on voyages of discovery, and on pilgrimages to forgotten

shrines of our own land. Many people from the East went to San Francisco's Panama Exposition and saw the old Spanish missions of the Pacific Coast for the first time. Others returned to their childhood homes "back East" and reexplored the "land of the Pilgrim's pride." Wedding journeys led to Washington, instead of to London and Paris. Thousands spent winter weeks along the old Spanish and French Gulf Coast; and entire populations in the Middle West revived memories of brave deeds in historical pageants.

Great Variety of Places of Interest

We suddenly discovered what travelled foreigners have long declared, that we have a national capital as beautiful and interesting as any in Europe; that the Hudson River is as picturesque and almost as storied as the Rhine; and that there are few regions in the United States that lack their places of romantic and historic interest. We have a rock as celebrated, in its way, as Gibraltar; a bridge of world-wide fame; battlefields where heroes fell for noble causes; houses in which great men were born, or where they lived and died; old towns founded by early explorers, and mountain peaks and journeys' ends that mark the limit of human courage and endurance. We have a cracked bell that proclaimed liberty to a listening world; halls that once rang with patriotic eloquence, and mission churches planted by faith in the savage wilderness.

Let us begin with Boston. You could spend a month in this chief city and seaport of New England, and, unless you had a guide-book, and made the best use of your time, you could not see half the things and places connected with Colonial and Revolutionary history. To see some of them you would have to take a short journey. Every year quite fifty thousand people visit Plymouth, the seaside village where the Pilgrims landed from the Mayflower in 1620. It lies thirty-seven miles south of Boston, and can be reached by train, boat, or by automobile.

Plymouth and Its Famous Rock

The chief object of interest here is the granite boulder used by the exiles as a stepping stone from their rowboats to the bleak shore of the New World. It lies today where it lay three hundred years ago, on the edge of the water of a small bay that is still a harbor for fishermen. But the rock is sheltered now, under the stone canopy of a small classic temple.

The rock, so honored, is of dark gray granite, flecked with mossy green and sparkling with particles of black mica, broken from some mountains of Northern New Hampshire, by the glacial cap that once covered New England. It was carried down to this sandy shore by the slowly moving flood of ice. It is only one, and probably not the largest, of many similar boulders and smaller rocks of the glacial drift that strew the soil of southeastern Massachusetts.

At the beginning of the Revolution that rock was taken to Liberty Pole Square. In hoisting it to a truck to be drawn by twenty decorated oxen, it fell and was broken in two. Daniel Webster delivered one of his most famous orations over it, at the celebration of the second centennial of the landing of the Pilgrims, in 1820. In 1834, it was removed to a place of special honor before the door of Pilgrim Hall.

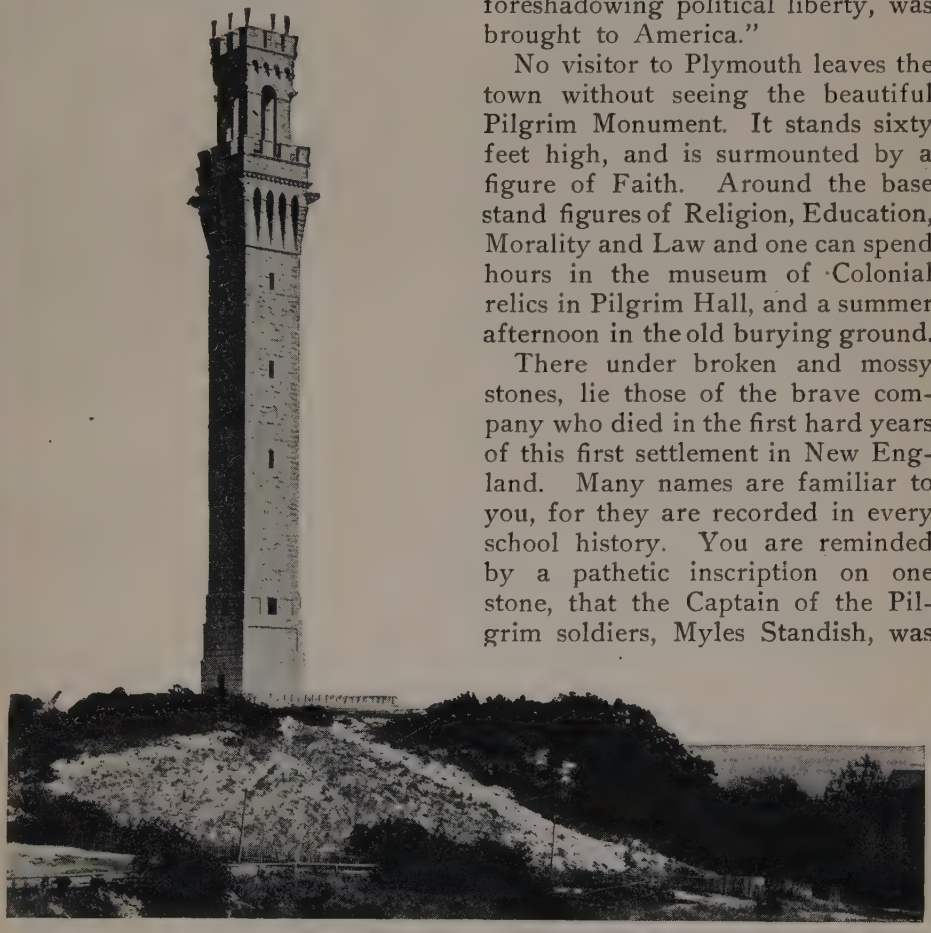
School boys and girls who were descendants from the Pilgrims of the Mayflower, formed an escort of honor, in Puritan dress. Then in 1880, it was taken back to its old resting place on the shore. The two pieces were cemented together and the temple was built over it.

Lincoln's birthplace is the only other humble thing in America that has been so distinguished. In our sketch of Lincoln we told you about the Memorial Hall of white marble, at Hodgensville, Kentucky, which encloses the decaying log cabin in which our great president was born. After returning from his tour of the world in 1877, General Grant stood uncovered before Plymouth Rock and said:

"This granite boulder is more inspiring than any National Monument I have ever seen. It marks the spot where religious freedom, foreshadowing political liberty, was brought to America."

No visitor to Plymouth leaves the town without seeing the beautiful Pilgrim Monument. It stands sixty feet high, and is surmounted by a figure of Faith. Around the base stand figures of Religion, Education, Morality and Law and one can spend hours in the museum of Colonial relics in Pilgrim Hall, and a summer afternoon in the old burying ground.

There under broken and mossy stones, lie those of the brave company who died in the first hard years of this first settlement in New England. Many names are familiar to you, for they are recorded in every school history. You are reminded by a pathetic inscription on one stone, that the Captain of the Pilgrim soldiers, Myles Standish, was



The Pilgrim Monument at Provincetown

The Pilgrim monument stands on the spot where the Pilgrims made their first, though not their permanent, landing in America. It is near Provincetown, Massachusetts. The monument is in the Italian Renaissance style. It is a little over 252 feet high, not counting the foundation, and is built of massive granite blocks. Each corner is reinforced by six twisted steel rods extending from the foundation clear to the top of the tower. Four stout steel bands are placed at intervals along the tower to strengthen it further.

The Bridge at Concord

It was at the point where this bridge stands that the English soldiers were halted by the Minute Men. The bridge, as you can see, has undergone a good deal of repair since that time. At the north end you can see French's statue of the "Minute Man"; a farmer boy in bronze who has dropped the plow handle and seized his gun.

soon bereft of Rose, his sweet English bride, and left a lonely, broken-hearted man.

The Bridge at Concord

Twenty miles north of Boston, between the villages of Concord and Lexington, a small wooden bridge, on stone piers, spans the Concord River. In appearance it differs very little from hundreds of other bridges in America, but it is one of the most famous little structures in the world. On a bronze tablet at the Lexington end, is recorded the fact that here, on April 19th, 1775, was shed the first blood of the Revolution.

What the Bronze Tablet Tells

The smallest history tells the story of how eight hundred British regulars were sent from Boston to capture, or destroy, the arms and ammunition collected by the Minute Men at Concord. By his midnight ride "through every Middlesex village and farm," Paul Revere alarmed the country. The Red Coats were halted at the bridge, and the stone walls that fenced the fields were soon lined with patriots. A third of the British were killed and the rest were chased back to Boston. So here is where:

"The embattled farmers stood,
And fired the shot heard 'round the world."

The whole neighborhood is historic. On the village Common of Lexington stands a beautiful monu-

ment which bears the names of the eighty-eight Minute Men who fell in the battle. And north of the bridge is Daniel Chester French's statue of The Minute Man. A farmer boy in bronze, he has dropped the plow handle and seized his gun. The town of Concord, also, is famous as the home of Emerson, Hawthorne, Thoreau and Louisa Alcott, and the houses where they lived and wrote their books are always pointed out to visitors.

You can return to Boston through Cambridge, a western suburb of the city, and see venerable Harvard University, and the historic elm tree, under which Washington took command of the Continental Army in June, 1775. He made his headquarters in a beautiful Colonial mansion —Craigie House. This, very wonderfully preserved, is now a literary as well as a historic shrine, for it was the Cambridge home of the poet Longfellow. A memorial filled with relics, it is open to the public. But Cambridge is so rich in associations that it needs a day to itself, and so does the old seaport city of Salem, with its customs house and the places made famous by Hawthorne's romances.

The Minute Men and the Famous Hill

After seeing Concord and Lexington one should return to Boston over the road followed by the twenty thousand Minute Men who camped on the hills north of the harbor, and fought the battle of Bunker Hill.

Bunker Hill Monument

General Gage had ten thousand British regulars in Boston, many cannon, and armed naval vessels in the harbor, while the patriots had only their old flintlocks and scant supplies of powder. Nevertheless they fortified Breed's Hill, an eminence one hundred feet high, and connected with Bunker Hill by a ridge. General Gage decided to drive this "rabble," as he called them, from their earthworks. From hills, upper stories and decked house tops, all Boston watched the fight. Three times the British swept up the slope, only to be driven back by sheets of rifle fire. Then, their ammunition exhausted, the patriots retreated, with a loss of General Warren and four hundred and forty-nine men. The British did not pursue them for they had more than a thousand of their dead to bury.

The most conspicuous object in the landscape of Boston today is the tapering monolith of granite known as Bunker Hill monument, built to commemorate a lost battle that was a dear victory to our oppressors. All the colonies were soon in arms, rallying to the help of the patriots who, with their gunstocks, stones and bare fists, had defended their liberty against the King's cannon. The monument rises two hundred and twenty-one feet above the center of the earthworks that were thrown up on the hill. The corner stone was laid by the Marquis de Lafayette, on the fiftieth anniversary of the battle, and Daniel Webster was the orator of the day. Since its completion in 1842, there have been few days in which visitors have not toiled up the nearly three hundred steps within the tower. From that dizzy height there is a panoramic view of one of the most historic landscapes in America.

A Lost Battle that Helped to Victory

While these brave deeds were being done in Boston, events of equal importance were going forward in

Philadelphia. News of the battle of Lexington stirred all the colonies to action. Within three weeks the Second Continental Congress assembled in the old State House of Pennsylvania Colony, and declared war on England. And a few days after the battle of Bunker Hill Colonel George Washington was elected Commander in Chief of the Continental Army. History was made fast in those stirring days. A year later the Declaration of Independence was signed, and proclaimed.

Independence Hall and Liberty Bell

The building that had the honor of being the birthplace of our nation is still standing in the heart of the city of Philadelphia. It is a plain, two-storied, brick structure, of a good Dutch Colonial design, and so well built that it has a solid, dignified appearance today, although it was erected many years before the Revolution began. It was long the largest and handsomest public hall in America.

Where Independence Was Born

Broad steps lead up to a wide entrance door in the middle of the front. This is flanked by four windows on either side, fitted with many small panes of glass. A row of nine windows above lights the large rooms of the upper floor. The roof slopes gently up from the four sides to a flat, railed platform. Every colonial seaport had its decked housetops from which people watched arriving and departing sailing vessels. From the middle of this State House deck a square clock tower and bell cupola springs. This was built in 1752 when a bronze bell was brought from London to hang in it.

The Continental Congress held its sittings in the east room on the main floor. The flooring of broad, white oak planks has had to be renewed, but the chairs and tables are historic relics, and around the exact copy of the Declaration of Independence on the wall hang the portraits of nearly all the signers of the famous document. The whole building is a historical American portrait gallery. Upstairs are pictures of many officers of the Continental Army, in their uniforms of blue and buff, some wearing cocked hats. There are portraits of distinguished foreigners who fought with Washington, and of members of the Constitutional Convention of 1787. "Lady" Washington smiles down from one wall, and the portrait of King George III, who lost this splendid colonial empire for England, hangs above a landing of the staircase.

Memories of Continental Congress

There are, besides, many relics: a piece of William Penn's "Treaty Elm"; two of his chairs; Washington's sofa and the church pew that he used when president; Benjamin West's painting of Penn's treaty with the Delaware Indians; old books, newspapers, posters, letters, colonial costumes, the original rattlesnake flag, and Franklin's first lightning rod. And tucked away in a small hall at the rear of the stairs, where it can be rescued through a back door in case of fire, Liberty Bell stands on a truck.

It is a strange thing to find this inscription: "Proclaim Liberty Throughout the Land, and Unto all the Inhabitants Thereof," around the rim, for the prophetic legend was cast in the bell nearly a quarter of a century before its wild and joyous clamor called the people to In-

The Prophecy in the Old Bell

Where the Great Declaration Was Signed

John Hancock sat in the high-backed chair behind this very table when he wrote his big, bold signature across the bottom of the Declaration of Independence. The table is Sheraton in design and has real drawers on one side, false ones on the other. It was made by an unknown cabinet-maker in Philadelphia about 1745, for the use of the Assembly of the Province of Pennsylvania. That body gave the Continental Congress, which drew up the Declaration of Independence, the use of its quarters in Philadelphia and that is how the famous document came to be signed on this table.

The high-backed chair is in the other famous English style of that period—Chippendale. It is hand-carved with designs which are typical of the future of this country—wheat stalks, waterfalls, horns of plenty, a sunburst and mushrooms. The two chairs at the sides have mahogany frames and were originally upholstered in horse-hide studded with brass tacks. Like the table, they are Sheraton, and have the graceful lines characteristic of that style. The legs of the high-backed chair show a little Chinese influence in the abundance of their decorations. This furniture is part of the collection of interesting historic relics in Independence Hall, Philadelphia

The Famous Charge Across the Wheat Field

One old soldier sitting on the rocks at Gettysburg is pointing out where General Pickett made his famous charge across the wheat field, at the fiftieth anniversary of the great battle. One of the most touching sights at the celebration was that feature of the program when a number of the old men who took part in that charge came trotting over the same wheat field carrying umbrellas instead of bayonets as they did on that momentous third day in July, 1863. At what is known as the "Wide Angle," where so many brave soldiers fell, these survivors of Pickett's men were received with outstretched arms and cheers by the old survivors of the army and navy; "You Yankees," as the heroes of this second charge were called, had tears in their eyes.

dependence Square to hear the first reading of the Declaration of Independence. In tolling it for the death of Chief Justice Marshall in 1835, the bell was cracked, and it has not been rung since 1842. In 1876 it was lowered from the cupola, to be exhibited at Philadelphia's Centennial Exposition, and has never been rehung. The people of distant parts of the country were so eager to see the sacred old voice of liberty, that it was loaned several times. But hereafter it will remain at home. It is too precious a relic to run the risk of journeys by land and sea. Visitors to Independence Hall stand with hats off, and gaze with reverence upon the old cracked and time-blackened bronze bell that so strangely fulfilled its mission to "Proclaim Liberty."

On the Field of Gettysburg

If you should ever go through Philadelphia to Washington, take the longer route, southwestward, and break the journey at Gettysburg. This site of the most famous battlefield of the Civil War is now a national park, and the consecrated burial ground of the many thousand soldiers from seventeen states who perished there. It lies directly north of Baltimore, and just within the southern boundary of Pennsylvania.

Where Brave Men Fell

Any history will give you an account of this terrible battle which raged during the first three days of July, 1863, over twenty square miles of a beautiful landscape of hills, woods and winding streams. The Confederate and Union Armies engaged each numbered about 80,000

men; and when General Lee began his retreat, on the saddest Fourth of July our country ever experienced, he left 30,000 brave boys in gray, dead or wounded, on the field. The Union army suffered a loss of 23,000.

Immediately after the battle, Governor Curtin of Pennsylvania organized field hospitals to care for the wounded; and Mr. David Wills of Gettysburg marked the graves of the dead. Seventeen states hastened to appropriate money to buy a burial plot in the center of the battlefield. Standing on a beautiful eminence from which there was a wide view, it was named Cemetery Hill. A landscape gardener planned the grounds, and to the unknown dead was assigned a plot in a vast series of semi-circles, in which each grave was marked by a small head stone. A beautiful monument now rises above this city of the dead.

Lincoln's Immortal Speech

On November 19th, 1863, four and a half months after the battle, Gettysburg Cemetery was dedicated, and President Lincoln made his immortal address of fewer than three hundred words. The speech was cast on a bronze tablet and set on the face of the monument which, towering sixty feet above the graves, is surmounted by a statue of Liberty holding a flag and a laurel wreath.

It seemed that the country could never do enough to honor the fallen on this field of supreme sacrifice. When the war was over, southern states marked the Confederate lines of battle, and northern states the positions held by their regiments. Then Congress purchased 1380 acres, more than two square miles of country, covering every hotly contested point of the battle. Tablets were set up, bridges and steel observation towers were built, cannon

General View of the City of the Dead

This is a general view of the National Cemetery. It shows the New York State Monument in the background and the National Monument on the right. The National Monument is sixty feet high surmounted by a figure of Liberty. In the marble around the base are designs symbolizing war, history, peace, and plenty. This statue marks the spot where Lincoln delivered his immortal speech when the cemetery was dedicated in 1863.

The City of Seven Thousand Tents

What a tremendous "City of Tents"! More than 7000 tents were pitched at the great Gettysburg anniversary, July 1st to 4th, 1913. This was done under the supervision of the War Department. As her share of the expense Pennsylvania appropriated $450.000, and more than $1,000,000 was spent by the National Government and states for the entertainment of the veterans.

Where Friend and Foe Drank Together

This is what is known as "Spangler's Spring" on the southeast slope of Culp's Hill on the Gettysburg field. Soldiers of both armies drank water here and mingled together freely during the night of July 2nd, a day which had seen some of the fiercest fighting of the three days' battle.

General Warren Watching the Battle

Don't you have to look twice to tell that one of these men is a statue? The man overlooking the field is General Warren, just as he stood watching the battle from Little Round Top. He is standing right on the spot from which he watched the battle. You can tell that he has a field glass in his hand—you can just see the edge of it—and on his right hip hangs the case that holds it. General Warren was Chief of Engineers of the Union Army when the Third Army Corps was attacked July 2nd. He rode Little Round Top and surveying the field, much as you see him here, saw at once the importance of holding this hill. He also saw a column of Confederates under General Law advancing to seize it. It was then occupied only by a signal corps.

How Little Round Top Was Held

This shows the breastworks of the 95th Pennsylvania Volunteers and the 140th New York Volunteers on the front slope of Little Round Top. It was breastworks like this, and the advantages of the position, that enabled the Union soldiers to hold Little Round Top in spite of the desperate attacks of the Confederates.

The Minnie Ball Monument

This monument to the 7th New Jersey Volunteers is a reproduction in granite of the minnie ball used by the Union forces. Captain Geo. W. Zeigler, a noted Union veteran, is here pointing out the scene on the battlefield where the soldiers fell, to whose memory this monument is erected.

Monument to the Confederate Dead

This is one of the typical Confederate monuments to be seen in all parts of the Gettysburg field. The inscription you see here is to Scales's Brigade of North Virginia, and the 13th, 16th, 22nd, 34th and 38th North Carolina Infantry.

One of Maryland's Tributes to Her Sons

This is a memorial of the members of the First Regiment, Eastern Shore, Maryland Volunteer Infantry, and shows the sharpshooter behind the breastworks. As the sharpshooters are famous for their marksmanship and were of more value than the average soldier, they did their shooting from hidden places, but they were really in quite as much danger as the men in the open field, for there were comparatively few of them and the enemy was apt to locate their hiding places and turn their fire upon them.

Monuments to the Cavalryman's Noble Friend

Here's another Pennsylvania monument, as you will see by the state coat-of-arms. It was erected to the 17th Pennsylvania Cavalry and stands on Buford Avenue in this great city of the dead. It is one of the most striking monuments in the field. Both the trooper and the horse are life size. You will notice in this cavalry monument, as in many others on the field, the noble horse is remembered as well as the man.

The most famous horse in the battle was General Meade's "Old Baldy," so called because he had a big white mark on his forehead and on down to the end of his faithful old nose. He was bought by General Meade in the fall of '61 and used continuously in all his campaigns. In the fighting of July 2nd he was seriously wounded and sent to the rear. He was slow in recovering and took no further part in the war, but was used by General Meade as a saddle horse for a number of years after the war. He survived his master many years and followed him in the funeral cortege to the grave.

The Garden at Mount Vernon

This is the part of the garden at Mount Vernon that contained the flowers. And it, no doubt, looks very much as it did in Washington's day, for the life of a country gentleman was his delight, and he kept a personal eye on every detail of the upkeep of his beautiful estate.

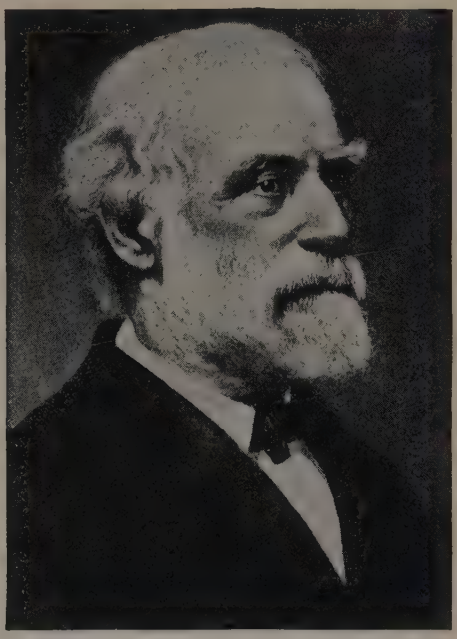
marked the positions of batteries and equestrian statues of the commanders were cast in bronze. Then Gettysburg was made a National Park, with an annual appropriation of $75,000 for its care.

Today, seventeen miles of roads and winding avenues have been opened, three hundred and twenty monuments unveiled, and two hundred and fifty cannon mounted. The shattered stone walls have been rebuilt and the woods replanted. Military maps guide visitors to Little Round Top, the Peach Orchard and a dozen other famous spots. Old soldiers hold their reunions here; raise their tent cities and camp with their dead comrades. In all the world, perhaps, there is no other battlefield so reverently cherished as the field of Gettysburg.

The Home of Washington

Fifteen miles down the Potomac from the National Capital lies Mount Vernon, the plantation home of Washington. April or May is the best time to visit it, for then the valley wears its dress of tenderest green, the air is soft, and the sun shines warm on the rippling water of the historic river. For miles you can look back and see the dome of the Capitol Building lifted two hundred and sixty-eight feet in the air, and farther away still, on a clear day, the monolith of the Washington monument can be seen cleaving the sky to a height of five hundred and fifty-five feet. It brings a thrill to every American heart to think that the loftiest memorial ever erected to any man has been raised to the father of our country.

Two Portraits of General Lee



These two portraits of Robert E. Lee are very interesting. The first shows him as a young man in the days before the Civil War, and the other after he became President of Washington College, now Washington and Lee University. On graduating from West Point, which he entered at eighteen, he joined the United States engineering corps. He took part in the Mexican War and was repeatedly distinguished for his ability and courage. After the Mexican War, he resumed his work as engineer in Washington and in Baltimore. In both portraits we can see great force, intellect, and character. What he said to his son when he entered him at West Point in 1852, he had previously said to himself: "'Duty' is the sublimest word in the language; you can not do more than your duty; you should never wish to do less." It was his conception of his duty that led him to espouse the cause of his native state, rather than that of the nation at the beginning of the Civil War.

Trolley cars and boats always stop at Alexandria, Virginia, to give tourists time to see Christ Church, a quaint, old, ivy-covered Gothic structure of stone where Washington, and, after him, Robert E. Lee worshipped. Here, too, is Arlington, once the beautiful home and great estate of the Lee family, but now a national cemetery, where thousands of soldiers of the Civil War lie buried.

Mount Vernon has a pier of its own, just as in the days when the tobacco from the 8000 acre estate was shipped to London. The house, a plain wooden mansion a hundred feet long, and fronted by a two-storied, pillared veranda, stands on a sloping lawn on a bluff that rises two hundred feet above the Potomac. This elevated situation gives it an extended view of the river, and the bordering hills and meadows of Maryland and Virginia. Washington loved this charming landscape which greeted his eyes every morning. But he left it at the call of duty, in May, 1775, and saw very little of it until after his retirement from the presidency twenty-two years later.

The great plantation was long ago cut up into numerous farms. The mansion and the two hundred acres around it were bought by the

ladies of the Mount Vernon Association, and restored to their old condition. The lawn is still shaded by trees planted by Washington and by distinguished guests; and every summer Mrs. Washington's flower garden is gay with her favorite blossoms.

The house never was as beautiful or impressive as Arlington, Westover, or many other colonial mansions of the Old South, but it was a well-built, commodious residence, and the eight tall and massive pillars that support the veranda roof were each squared from a single forest tree. And it was handsomely furnished, as was suitable to a family of wealth and position. Many of the fine pieces of mahogany furniture, and elegant appointments of living, have been found and restored to their old places.

If Washington had been as great an Englishman as he was an American he would have been buried in the chill splendor of Westminster Abbey, far from the home he loved and the wife of his youth. We are glad he lies here, in a tomb near the carriage gate, under the sun and stars and within sound of the rippling waters of the Potomac.

The Lincoln Home in Springfield

Memories of the Great Man

The only other house in our country that arouses the same sentiments as Mount Vernon, is the Lincoln Home in Springfield, Illinois. This is a plain, two-storied frame house of about ten rooms, such as any country town doctor or lawyer might own. It stands on the corner of Jackson and Eighth Streets, several blocks from the public square, and when built probably had plenty of open prairie around it. Now the section is closely built up with modest homes, and the Lincoln house is crowded on its small frontage. The lot is a couple of feet higher than the sidewalk, the rise faced with stone and topped with a picket fence. Only a narrow strip of lawn separates the fence from the house, and a flight of steps leads up through the gate to the entrance door.

A connected parlor and library open from one side of the middle hall, and from the other a sitting room and dining room. There is nothing of intrinsic beauty or value in the house or its contents, as there is at Mount Vernon. But it is the place that sheltered our martyred president for many years, and now it is a museum of relics which recall him to our memories. The place is filled with the furniture he used, the books he read, the letters he wrote, his numerous portraits and photographs, the hundreds of books written about him, the tributes paid to him, and pictures of the many monuments, bas-reliefs and tablets that have been set up in his honor.

An endless procession of people sit at Lincoln's old walnut secretary, and inscribe their names in the visitors' book, and then spend hours studying the eloquent records of his simple, heroic life and tragic death. It brings one nearer to Lincoln to realize that he spent many obscure years of quiet devotion to ordinary duties in this plain American home in a small Western city. In striking contrast to the circumstances of his every day life is the splendid marble monument which towers above his tomb in Springfield cemetery.

A Visit to Old Jamestown

There are two comfortable ways of travel by which you can reach

Arlington, The Home of Lee

The home of the Lees at Arlington was, as you see, built in the colonial style with a high porch and Grecian pillars of the Doric order. Arlington was the beautiful estate of Mary Custis, great granddaughter of Martha Washington. It lies opposite the city of Washington on the Potomac and is now used as a national cemetery. There Lee lived for 30 years and until the outbreak of the Civil War. Being so near Washington, it was directly on the line of defense of the Capital and immediately fell into the hands of the North.

A Portion of the Servants' Quarters at Arlington

A regard for the comfort and well-being of everyone for whom he was in any way responsible, was one of the finest traits of Lee, and we can see here what comfortable quarters were provided for the colored people on the Arlington estate. The affectionate title, "Marse Robert," which they always used in speaking of or to their master, became the one which was applied to the great military leader by the people throughout the South.

the deserted site of this first English settlement in America. One is by railway through Richmond, Virginia. The other is to take one of the excursion steamers which ply the historic waters of Chesapeake Bay, at Baltimore or Washington. The water route takes you to a number of places connected with the Revolution, the War of 1812 and the Civil War. And then, running thirty-five miles up the broad estuary of the James River, you can land on the same swampy peninsula, jutting from the north bank, on which the London Company landed its ill-fated colonists in May, 1607.

Water Trip to the Historic Site

Jamestown Point is almost as wild and uninhabited today as it was more than three centuries ago, for the site is low and marshy. It was chosen for the settlement for the reason that a short stockade set up across the neck of the peninsula made it easily defensible against the Indians. It was convenient, too, to the sailing vessels of old days. So, although it was extremely unhealthy, The Point was occupied until 1700, when it was abandoned for the new capital at Williamsburg. Nothing marks the place now as the capital of Virginia colony for almost a century, except the fallen slabs in a weedy, briar-grown grave yard, and the crumbling tower of the little stone church in which the Princess Pocahontas was married to the English John Rolfe.

Williamsburg was the capital of Virginia until 1780, when, threatened by the army of Cornwallis at Yorktown, the seat of state government was removed to Richmond. The road northward to Williamsburg, from Jamestown landing, is lined with some of the oldest plantations in America, with their colonial mansions and clusters of negro cabins. It is such a busy, modern little town of 2500 people, today, that it is difficult to imagine it the center of stirring Revolutionary days in Virginia. But its principal thoroughfare is still named Duke of Gloucester Street, and there are the venerable buildings of William and Mary College, whose doors were opened to students in 1693. Thomas Jefferson is numbered among its alumni, and in the ancient Hall of Burgesses the future author of the Declaration of Independence was stirred by the fiery eloquence of Patrick Henry.

But, somehow, when we think of the ivy-covered church tower, and the neglected graves on the desolate marsh of The Point, we wish all those brave things might have happened in Old Jamestown which, for nearly a hundred years, kept the lamp of civilization burning in the wilderness of Virginia.

St. Augustine and the First White Settlement

No tourist to the east coast of Florida misses seeing this picturesque Spanish city, where, in 1565, was made the first white settlement in the United States. A popular winter resort, on the way to Palm Beach and Miami, it stands on Matanzas Sound, two miles from the ocean, and thirty-seven miles south of Jacksonville.

The Spaniards were not concerned about clearing farms and making homes. It was soldiers, gold seekers and missionaries who penetrated each new colony and built a beautiful little walled capital in the wilderness. St. Augustine, like Havana, had its fortress, its governor's pal-

The Old City Gates at St. Augustine

These gates are the most picturesque of St. Augustine's ruins. The two pillars are in the Moorish style of architecture and are surmounted by what the architects call "pomegranates" because they are shaped like the fruit of that name. The wall once extended from the old fort, a short distance to the east, across the peninsula to San Sebastian on the west, thus fortifying the town against all approaches by land. These gates stand at the end of St. George Street, the principal avenue of St. Augustine.

How St. Augustine Was Built

ace, its church and monastery, and many handsome residences. Native quarries of coquina, or shell concrete, a very hard stone as white as marble, were worked by enslaved Indians for quite a hundred years, to build St. Augustine. The fortress of San Marco, completed in 1742, was so well built that it is used today as Fort Monroe. The Franciscan monastery serves as barracks for our soldiers, and the post office is housed in the governor's palace. The old gate pillars, twenty feet high, with fragments of the ancient wall are still standing; the Spanish coat-of-arms is emblazoned on the ends of the bridge, and there is the black dungeon which, among its many prisoners, numbered the famous Seminole chief, Osceola.

The town is, today, as Spanish as any old city of Spain. Crowded, as it was, within stone walls, and at one time containing a population of twenty-five thousand people, it is full of narrow, cobble-paved lanes, overhanging balconies gay with blossoming plants, red-tiled roofs, patios filled with palms and oleanders, and tinkling with fountains. Many new buildings have been erected for the comfort and pleasure of the tourists who visit the place every winter, but hotels, casinos and the mile-long, seawall promenade, all built in the Spanish style.

Standing on the yellow sands, beside the blue water, drenched with sunshine, and shaded by dark magnolias and feathery palms, St. Augustine makes a strange, exotic picture, a vision of a vanished past. Except in the tourist season, when it is filled with pleasure seekers, it seems silent and deserted, for, with only five thousand inhabitants, three-fourths of the old houses are empty. A charmed city of dreams, it sleeps in the sun beside a semi-tropic sea.

The "Oldest House" in St. Augustine

The framed statement on the right of the entrance to the garden tells you that this is the "oldest house" in St. Augustine. But it is a good deal like the boy's jack knife. You remember it had entirely new blades and a new handle. So, probably, if the house which used to stand on this spot was still there it would be the oldest house in St. Augustine, but, as you can see, the weatherboarding and shingles are very modern. This kind of "improving" was done a good many years ago when the rich people who built villas for their winter residences in St. Augustine were pulling down most of the old houses, and the people of humble means followed their example by "remodeling." One proprietor of a boarding house had a picturesque old coquina wall pulled down because it obstructed his view, and put up a picket fence instead. It was even proposed to pull down those old city gates for the stone that was in them, but fortunately, they stopped at that and now nobody values the relics of the old days more than the people of St. Augustine.

The "Independence Hall" of Texas

Coming up from Mexico, the Spaniards founded a number of towns in Texas, New Mexico and Arizona, as you can easily see by the many Spanish names on any map of the region. Santa Fe, settled in 1582, is the second oldest city in our country, and the mission of San Miguel there is the oldest church in America north of the Rio Grande. But the mission church of Del Alamo, in San Antonio, is the most famous, although it was not completed until 1744. It is the Independence Hall of Texas.

Any resident of the city will point out the plain, old building with its massive walls of adobe, or sun-dried bricks. Once, no doubt, it had a garden around it, kept green by irrigation, for "Alamo" is the Spanish name of the poplar tree, or the cottonwood so common in our Southwest wherever there is

water. But now the church stands in the heart of the city, shut in by streets of little shops and markets.

Texas, you know, was once a part of Mexico, and had to fight for its freedom from Spain. That was gained in 1821, but by that time a large part of the population of Texas consisted of emigrants from our southern states. These, used to the orderly, progressive government of the United States, found Mexican rule intolerable. So, in 1835, they began a revolution which lasted ten years. Then they set up a republic in Texas and asked for annexation to the United States. This involved our country in the Mexican War of 1845.

The most famous battle of Texas's long war for liberty was fought in San Antonio, and involved only one hundred and fifty of the bravest patriots of the state. Determined to hold the town against an army of several thousands of Mexicans under General Santa Anna, this little band of defenders took refuge in the Alamo, mounted cannon on its thick walls, and raised a new flag—a big white star on a striped field. Texas, today, is called the Lone Star State. Singing a new song: "Up with your banner, freedom," they waited for the attack.

The Brave Fight at The Alamo

One of the soldiers in this famous edifice turned into a fort was Davy Crockett, a frontiersman as bold and resourceful as Daniel Boone. His favorite phrase was: "Be sure you're right, then go ahead." Another was Colonel Bowie, after whom the Bowie knife was named. A third was the gallant young Colonel Travis. With such men the only answer to a demand for surrender was a derisive shout and a cannon shot. Through port-holes Crockett and other sharpshooters picked off Mexican gunners. The little garrison held out until food, water and powder were exhausted, and all but six men had been killed. When the Mexicans broke in, to put the rest to the sword, for they gave no quarter to prisoners, they found Crockett wounded but barricaded behind a heap of his fallen comrades, his sure finger on the trigger. Every one of that brave little band perished, but their souls went marching on. All Texas was roused to fight to the death for freedom from Mexican rule.

So this old mission church is the cradle of Texan liberty. Texas rangers went into every battle of the Mexican War with the rallying

Ruins of the Alamo at San Antonio

This is all that is left of the fort in which the men of Texas—only 150 of them, against 4,000 Mexicans—made their historic defense. The building was originally erected for a mission and was used for religious purposes until 1793. Then because its walls, as you see, were so thick and strong, it was converted into a fort.

cry: "Remember The Alamo!" The phrase is used in song and story, and wherever men urge one another to some supreme test of courage and lofty patriotism.

The Old Spanish Fort

Here you see the walls and the moat of the old Spanish fort at St. Augustine. The bridge which now spans the moat is a modern structure of pine, but in the old days at the gate there, which was the only entrance, was a portcullis with machinery for hoisting and lowering the drawbridge as they did it in Scott's poems and in story books of the Middle Ages. This bridge connected with another that extended part way across the moat. When you visit the old fort you can go through secret passages and into the dungeon just as you would in a story-book castle. And they show you the furnace for heating shot to make it as unpleasant as possible for an attacking party. The roofs and the floors of the fort are scored with the initials of the hundreds of tourists who have visited St. Augustine from time to time.

The Story of the California Missions

There are twenty-one Spanish missionary churches of varying size and beauty, and in various stages of preservation, scattered along the coast of southern California from San Diego to Sonoma, above San Francisco. They are all built as hollow squares, colonnaded or cloistered, with pillars supporting a series of round arches, and are roofed with tiles. All the rooms open on the patio, or inner court, with its garden and fountain. And each has its cells for the Brothers, its guest rooms, workshops, store rooms and school rooms. The good, simple Mission furniture is made in many of them, and Indian and Spanish Mexican boys and girls are taught the useful trades and household arts. Each, too, is the center of a large, populous and prosperous district, long cultivated, and rich in flocks and herds, grain fields and fruit farms. This is their story:

Great Work of Fra Junipero

Nearly a century after the settlement of Santa Fé, Fra Junipero Serra, a Franciscan friar, was sent from Mexico City with the magnificent plan of building this long chain of mission churches and converting

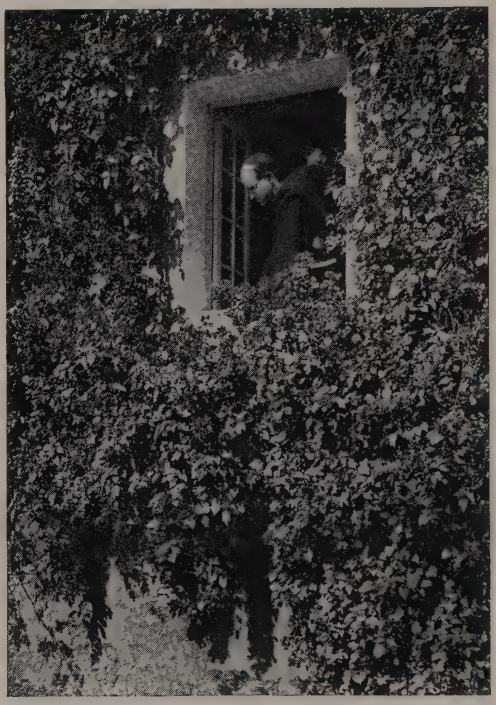
One of the Ruined Chapels

What an air of sad reminiscence there is about this picture of the crumbling remains of a chapel of one of California's missions—that at San Juan Capistrano. As we look at it we think how all the good padres who were doing their noble work when this chapel was first built, have gone, and how many of their mission churches are crumbling back to earth. But their work still lives. Go into any Indian village in the region where these missions were established and you will see on the wall a cross, crudely fashioned of wood or woven of grass. You will also find this emblem of their faith on the high hills and at crossroads, planted in little heaps of stone; "water-stained and sun-cracked," says Dr. van Dyke, "but still the sign before which the Mexican peon and the Indian bow their heads and whisper words of prayer."

and civilizing the Indian tribes of the California coast. The Franciscans were not cloistered monks but working, teaching Brothers. They were skilled in engineering, building, agriculture, stock raising, and all the handicrafts, and were wonderful in organization and government. They knew how to select the most fertile land and to construct irrigation works to water it, and how to make their churches and monasteries social, industrial, and political centers.

Up and down the coast Fra Junipero journeyed, sometimes in boats, sometimes afoot, wearing a path with his sandaled feet that became a trail and then a wagon road. At last he reached the Bay of Monterey and built the mission of San Carlos. The founding of a mission at this point had been the subject of prayer in Mexico City for two centuries, ever since Francis Drake, the English explorer, touched the California coast. When news of Fra Junipero's arrival there reached Mexico City, the bells of the cathedral were rung as for a festival, and high mass was celebrated.

A Priest at the Window



Here we see a priest at the window of what is called his "cell," the small, simply-furnished room in which he lives. How picturesque is the whole effect; the scholarly face of the priest, the thick, clustering vines about the window, the sunlight and the clear-cut shadows of the warm, bright land of Southern California.

In the meantime the saintly missionary was living in a shelter of branches on the beach, where he had set up a cross, and hung a small bell to call his sailors and curious Indians to matins and vespers. There is a beautiful church at Monterey today that is often pointed out as the one he built. It has a setting of great beauty among the hills and woods with the stretch of sandy beach along the bay and the town nestling in the lower folds of pine-clad hills. And in this Presidio Church are many relics and memorials of Fra Junipero's missionary labors. But they were probably recovered from the older mission of San Carlos.

This is still standing six miles from the town, to be reached by automobile or on horseback, over the rough hills. Think now, of that frail priest, for he was always lame, and often ill from the pain of an ulcered leg, tramping in sandals and long gray gown, over those hills when they were covered with tangled forests. He found a site for his church in lovely Carmello Valley, and set his sailors and Indian

One of the Towers of Old San Marco

This picture shows one of the towers of the fortress of St. Mark or San Marco as it looked before the stronghold was taken possession of by Uncle Sam and converted into Fort Marion. How picturesque this corner of the old castle looks with the weeds and lichens growing in the crannies of its walls and along its parapet! From this tower the sentinels kept watch and undertook to announce the approach of unwelcome guests, so that shot could be heated for their reception, as explained under the illustration showing other portions of the fort.

converts to work felling trees. It was only a simple log church and monastery that he built at first, roofed with thatch and enclosed in a stockade. But he set up a huge timber cross and hung bells from a roofed with tiles. But population fell away from Carmello Valley and drifted to Monterey. In 1845 the old mission was abandoned. The roof fell in, and weeds and grass grew from every crevice. Then, in

Court of Santa Barbara Mission

This picture shows you the beautiful patio or inner court of the mission at Santa Barbara. The fountain at which the two brothers are standing was not playing when the picture was taken. Looking at the scene, we can with the help of the text form a very vivid picture of what life in one of these missions is like: "They are built as hollow squares. All the rooms open on the patio or inner court with its garden and fountain. And each has its cells for the brothers, its guest rooms, workshops, storerooms, and school rooms."

framework bedded in stones. Within ten years Monterey was a large and prosperous town and the capital of California. The twenty-one missions were established before Fra Junipero died, in 1784, and was buried under the floor of his little wooden church of San Carlos. The monumental task was finished in the short space of fifteen years.

After his death a new church of a yellow stone almost as soft as adobe, was built over his grave, and 1868, the work of restoration was begun, and today the mission church of San Carlos is the tomb and monument of California's saintly apostle. Enough people have been found among the hills to form a small congregation, and priests take turns in coming over from the Presidio Church of Monterey to hold occasional services.

On Monterey Point, where Fra Junipero first landed, Mrs. Leland Stanford has set up a white marble

statue of him, in the act of disembarking, one hand upraised, the other clasping his Bible. He greets every visitor who runs down from San Francisco to see the Bay, far famed for its beauty, and the town whose foundations he laid by setting up an altar on the beach. In the same way he appeared at every mission along the coast.

Except Pere Marquette, no other early missionary in the wilds of America presents himself to the imagination as such a heroic, devoted and appealing figure as Fra Junipero Serra. The Spanish Franciscan was, besides, a man of vision, and an organizer like La Salle. His life goes far to redeem Spain's long record of cruelty and greed.

Father Junipero's Monument at Monterey

On Monterey Point, where Father Junipero first landed, Mrs. Leland Stanford has set up a white marble statue of him in the act of disembarking, one hand upraised, the other clasping his Bible. The inscription on the marble block reads as follows:

"Here June 3, 1770, landed very Rev. Father Junipero Serra, O. S. F., and founded the following Missions: San Diego, July 16, 1769; San Carlos, Monterey, June 3, 1770; San Luis Obispo, Sept. 1, 1772; San Francisco de Los Dolores, Oct. 9, 1776; San Juan Capistrano, Nov. 1, 1776; Santa Clara, Jan. 18, 1777; San Buenaventura, Mar. 31, 1782. He died Aug. 28, 1784, in San Carlos Mission, Carmello Valley. 'As the Lord liveth, even what my God saith, that will I speak.'

"This monument erected by Jane L. Stanford in the year 1891, in memory of Father Junipero Serra, a philanthropist seeking the welfare of the humblest, a hero, daring and ready to sacrifice himself for the good of his fellow beings, a faithful servant of his Master."

Jacques Cartier

In the seaport of St. Malo, 'twas a smiling morn in May,
When the Commodore Jacques Cartier to the westward sailed away;
In the crowded old Cathedral all the town were on their knees,
For the safe return of kinsman from the undiscovered seas;
And every blast that swept o'er pinnacle and pier,
Filled manly hearts with sorrows, and gentle hearts with fear.

A year passed o'er St. Malo—again came round the day
When the Commodore Jacques Cartier to the westward sailed away;
But no tidings from the absent had come the way they went,
And tearful were the vigils that many a maiden spent;
And manly hearts were filled with gloom, and gentle hearts with fear.
When no tidings came from Cartier at the closing of the year.

But the earth is as the future, it hath its hidden side,
And the Captain of St. Malo was rejoicing in his pride;
In the forests of the North—while his townsmen mourned his loss—
He was wearing on Mount Royal the fleur-de-lis and cross;
And when two months were over, and added to the year,
St. Malo hailed him home again, cheer answering to cheer.

He told them of a region, hard, iron-bound, and cold,
Nor seas of pearl abounded, nor mines of shining gold;
Where the wind from Thulé freezes the word upon the lip,
And the ice in Spring comes sailing athwart the early ship;
He told them of the frozen scene, until they thrilled with fear,
And piled fresh fuel on the hearth to make them better cheer.

But when he chang'd the strain—he told how soon are cast,
In early Spring, the fetters that hold the waters fast;
How the wintry causeway, broken, is drifted out to sea,
And the rills and rivers sing with pride the anthem of the free;
How the magic wand of Summer clad the landscape to his eyes,
Like the dry bones of the just when they wake in Paradise.

He told them of the Algonquin braves—the hunters of the wild;
Of how the Indian mother in the forest rocks her child;
Of how, poor souls! they fancy in every living thing
A spirit good or evil, that claims their worshipping;
Of how they brought their sick and maim'd for him to breath upon;
And of the wonders wrought for them, thro' the Gospel of St. John.

He told them of the river whose mighty current gave
Its freshness for a hundred leagues to Ocean's briny wave;
He told them of the glorious scene presented to his sight,
What time he reared the cross and crown on Hochelaga's height;
And of the fortress cliff that keeps of Canada the key;
And they welcomed back Jacques Cartier from his perils o'er the sea.

THOMAS D'ARCY MCGEE

The Children and Their "Great Republic"

THE most fortunate children in the world are the boys and girls who live in America. This is partly, but not chiefly, because ours is a land of plenty, with rich valleys and broad prairies which "when tickled with a hoe, laugh with a harvest."

A stalwart immigrant on the dock at New York gathered in his arms four lads, his sons, just landed, whom he had left in Europe because he had no money to bring them with him. Now, after years of work and thrift, he had prepared a home and had sent for them. Leading them up from the dock, he halted, and pointing at the flag floating above them he said: "My sons salute your flag; this is your country, the land of the free," and with bared heads, father and sons saluted the Stars and Stripes.

Like them many millions of men, women, boys and girls, through the long years, have come from across the sea to free America. If at first they came to better their condition, they have lived here to learn that America is prosperous because she is free.

The charter of our freedom is found in our national constitution, the fundamental law of the land. You need to know what this constitution is, how under its provisions all citizens are free and equal before the law, equal in opportunity to secure education and personal advancement and to reap the reward of individual endeavor. You need to understand your responsibility as a citizen, for with your vote you help to elect the men who make and who administer our laws. You need to appreciate the fact that it is your government, that you are a part of it; that as a citizen you have a sacred trust, of which you should be proud.

You should also know how our nation has moved forward, how its mighty resources have been both conserved and developed. This splendid story you will find written in this book. You will read of how in the development of mines, the improvement of agriculture, the irrigation of arid plains, in free schools, and in a thousand ways, your government like a wise father, has nourished and promoted the welfare of its people. You should stand by it, and you should note thoughtfully that if there are defects in our laws, the remedy is in the hands of the people, and there is never an excuse to seek change by violence.

Chandler B. Beach

The Soldier and His Country

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF STAFF,
WASHINGTON.

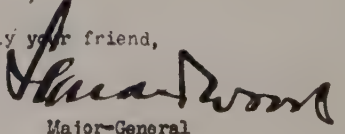
TO A BOY WHO WISHES TO ENTER THE ARMY:

I have been asked to write a few words to "A Boy Who Wishes to Enter the Army". This I gladly do, in the hope that what I write may be of some help to the boy who is anxious to become an officer, and may also be of benefit to the service by bringing into the Army the right kind of boy.

In making up your mind as to whether you wish to be an officer, an important thing to be remembered is that a career in the Army offers none of the pecuniary rewards that may be obtained in the other professions. The greatest reward to which you can look forward in the military profession is that which comes from the approval of your superiors and the consciousness of good conduct and efficient performance of duty. I cannot impress too strongly the fact that the idea of duty is the key-note of the military profession. The Military Academy at West Point, where so many of our officers are educated, has adopted for its motto; "Duty, Honor, Country;" and the cadets are taught that if they always do their full duty, the demands of honor and the obligation to serve their country faithfully will be fully met. By pointing out to you, however, that the Army affords only a reasonable living I do not want you to attach too much importance to the acquisition of wealth. There are a great many other things to which a right-minded boy should aspire and many of these things are found in the officer's career. It is an honorable profession, so much so that the terms "officer" and "gentleman" have come to mean the same thing; it is free from many temptations that in politics and business assail the ambitious young man and oftentimes destroy the high ideals with which he begins his career; it is a life position held subject only to good conduct and efficient performance of duty, a condition which enables you always to do your duty without fear or favor. The duties you will be called upon to perform, both in peace and war, demand the exercise of a high intelligence and an upright and resourceful spirit. And finally, in making up your mind on this important question, I ask you to remember this striking fact: that whenever the country is brought face to face with an emergency in which all the ordinary agencies fail--whether it is to establish stable government among a dependent people, or to help a community devastated by flood or earthquake, or to dig the Panama Canal--the work is entrusted to the officers of the Army with full confidence that it will be well and faithfully done.

With best wishes for a successful career, I am

Sincerely your friend,



Major-General

The Army and the World War

Studying the War Map
These two officers are studying war maps during a campaign.

CHILDREN who were old enough to be in the primary grades in school in 1917 will always remember the great war which the United States fought with England, France and their allies, against Germany and her allies. Presently we will tell you just what the little tots and older boys and girls did to help win that war. But first we must tell you what it was all about, and why our country took no part in it until other countries had been fighting for nearly three years.

Really to understand it you should know how differently from other great nations the people of the United States have always felt about war; and why we had no big, standing army and military supplies in readiness. When George Washington was living we fought the Revolutionary War to win our liberty. In the next hundred years we fought four more wars. They were all on American soil, and to right some wrongs, or to protect our own country from danger. We had no big, quarrelsome neighbors to bring trouble upon us; and because we were so far away, across three thousand miles of ocean, and they were always busy fighting each other, the great nations of the Old World let us alone. Besides, as we had won all our wars with volunteer soldiers, we thought that we could always raise a large army quickly, if we had to defend ourselves.

Why Our Army Was Small

We got that idea in colonial and pioneer days when most American men needed very little train-

Beginning a Pontoon Bridge

It is important that soldiers should know how to build bridges. Pontoon bridges are hurry-up affairs and have been used by armies ever since Xerxes crossed the Hellespont on one, and probably before. In the picture the New York National Guard is building one.

ing to make good soldiers. Men who had fought Indians, hunted wild game, and chopped down forest trees to build cabins, were brave, hardy, and resourceful. They could shoot straight, make long marches, and stand all sorts of hardships. Then war was a simple matter when a block-house made a good fort, and soldiers fought with hand weapons. The older, experienced men were good leaders in the rough-and-tumble fights at Lexington and Bunker Hill. But there were so many things they did not know about drilling and commanding men, keeping them in good health, and winning big battles, that General Washington opened an officers' training school at West Point, on the Hudson River, in 1778.

There the new United States built one of the finest military academies in the world, for officers were needed for a small regular army of 50,000 men, whose chief duty was to keep the Indians in order. As a home guard, which the President could call upon to defend our country from attack, the states kept up the system of a partially trained militia of the old colonies. Before the War of 1812, we had a good, small navy, too, and an academy for training naval officers at Annapolis, Maryland.

Now the country grew and spread westward, and filled up with people very fast. By the time of the Civil War, in Lincoln's day, many of our soldiers came from shops, offices, and factories of cities and towns. Although they had never handled a gun, or slept out of doors in their lives, they made the best and bravest of soldiers. But we know now that if they had been properly trained and supplied in the beginning, the war could have been won sooner and with less loss of life.

Almost Finished

Long timbers are fastened to floating supports or pontoons and covered with crosspieces that make a level board walk. Pontoon bridges are usually built as quickly as possible and are not expected to be permanent. Notice how the long timbers are fastened together.

A Bridge That Will Carry Big Guns

The upper bridge is made to furnish a safe highway across water for marching men, but this bridge has still greater burdens to bear. As you can see, it is also a pontoon bridge but it is built strong enough to sustain the weight of heavy guns. What do you suppose the sacks are for? They are filled with sand and have been piled on the bridge as a test. The combined weight of the sacks and all the men shows that this bridge will safely carry artillery whose weight amounts to fifteen tons upon each axle.

Over the Ramparts

The soldiers are storming and taking mock fortifications in a sham battle given before a big audience.

After the short war with Spain in 1898, we doubled our regular army and began to build up a large, modern navy. With the Philippine Islands and the Panama Canal Zone to govern and guard, and Cuba to help become a peaceful little republic, we had become a world power. We had more police duty, some of it far from home; we could no longer say that nothing outside of America concerned us, or be sure that we could continue to avoid trouble. Many people, among them President Roosevelt, thought that if we should ever have a war with a big foreign power, our country might be invaded before we could get ready to defend ourselves, and that we should be better prepared.

You see, the Atlantic ocean was no longer the protection that it had been in early days. In 1620 it took the Pilgrims ten weeks to cross it, in a small sailing vessel that carried only one hundred passengers and their goods. Now, huge ocean steamers that carry thousands of people and thousands of tons of freight, cross that ocean in five or six days. And fast railroad trains rush across continents. That makes Europe and America near neighbors.

Since travel and trade became so easy, the small crowded lands of the Old World stopped trying to grow all their food. By making goods in factories, to sell in far-away lands, they could buy bread-stuffs, meat, sugar, leather, oil, rubber, cotton, wool, and other things they needed. Many years ago it was known that if trade with western Europe was stopped, millions of people would be starved.

The New Method of Warfare

When Germany and Austria suddenly began a war of conquest against France, Russia, and Serbia

A Portable Telegraph Station

An army not only carries its telephone lines along with it nowadays, but its telegraph, too. The picture shows a wireless aerial mounted on a motor truck. By means of this the officers in charge can communicate with each other, the President at Washington and even ships at sea.

A Field Telephone

When the army is in action, wires are strung up connecting the commander with all parts of the battlefield. This is "central"—a soldier with a portable switchboard somewhere behind the battle front—connecting one of the commanding officers with a distant division of his force.

in 1914, it was the duty of the United States to be neutral—that is, friendly to both sides—and keep trade open on the sea.

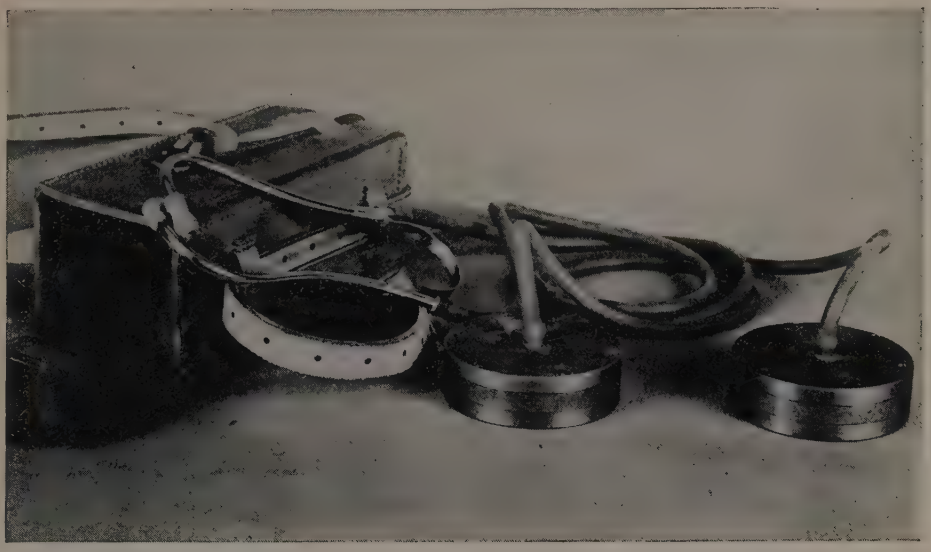
Then we saw what a swift, terrible thing war had become. There were no more long, slow marches. Millions of highly trained soldiers were rushed to the battle front in railway trains. Freight cars and motor trucks had taken the place of horse-drawn baggage wagons and gun carriages. Airships and balloons were used for scouting. Messages were carried, not by Paul Reveres, on horseback, but by wireless telegraph, telephone wires, wireless telephone, and by motorcyclists.

Soldiers, too, had to have a different sort of skill and bravery. They still had to be able to shoot, and use bayonets, but they had also to be machinists, electricians, and engineers. They had to learn how to throw hand grenades, and how to live and keep in health in the foul mud of deep trenches. When they went "over the top" in attacks, they had to face the fire of self-feeding machine guns that spattered hail storms of bullets. They had to cut their way through electric, barbed-wire entanglements, and charge across fields planted with explosive mines. Since airplanes dropped bombs from the sky on trenches, marching columns and supply trains, they had to learn a new art of concealing roads, gun positions and defense lines. This was called by the French word "camouflage." They had to learn to mount and manage anti-aircraft guns, to shoot the bird-like airplanes on the wing.

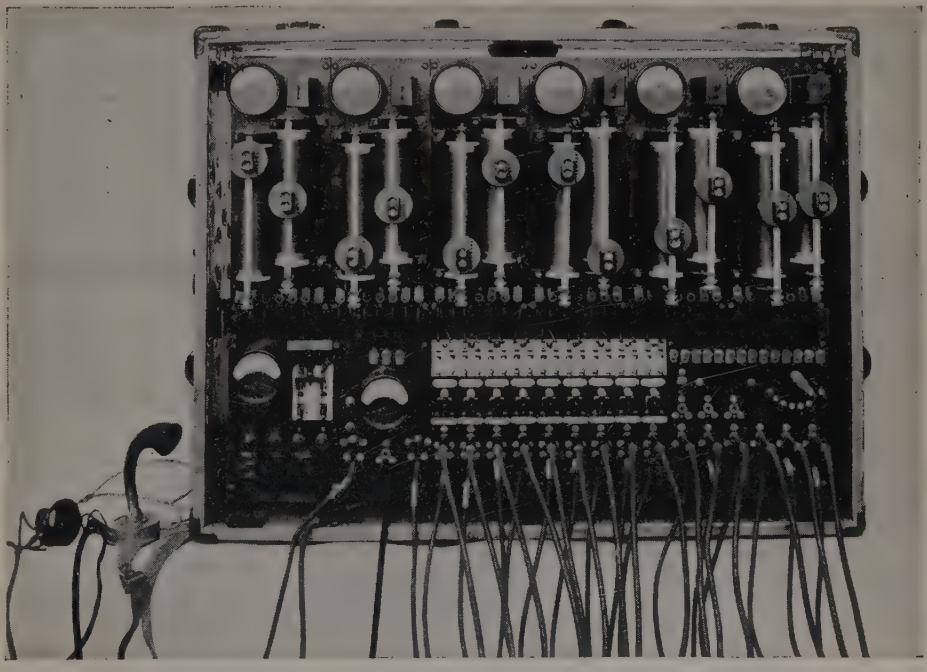
The Soldiers and the War by Machinery

Germany and her allies, Austria,

Talk About Sharp Ears!

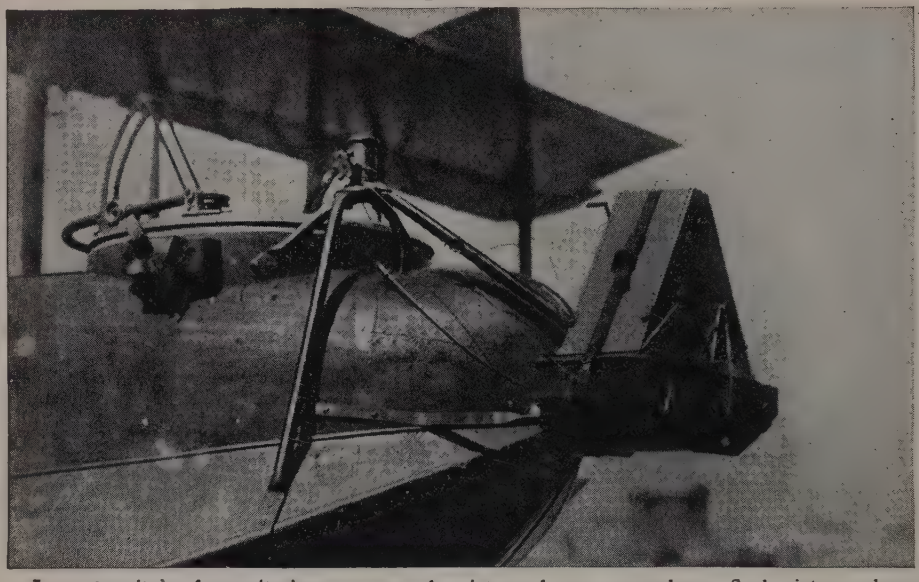


Even "little pitchers with big ears"—you know that's what they call small people who seem to hear everything that is going on around them—are not to be compared with the mechanical



listeners you see in these two pictures. The upper one is for listening to the enemy digging under ground and trying to lay mines to blow you up. By this device and others like it located at different points, skilled men are able to calculate the location of hidden guns by the difference of the length of time it takes the sound of the firing to reach these listening places. The hiding place of one of the "Big Berthas" that fired on Paris, seventy-five miles away, was so discovered.

Three Snap Shots in One



In wartare it is often quite important to take pictures from an aeroplane. Such pictures show the position of enemy defences, the disposal of bodies of men and give other information which it is very desirable to have. This picture shows one of the cameras used for this kind of work. It is called the Bagley Camera and its merit is that exposures made at intervals produce a continuous photograph.

Turkey, and Bulgaria, not only had the largest and best-trained armies, and vast stores of military supplies to fight with, but they broke all the rules of warfare which civilized nations had agreed to keep. To reach France quickly, Germany marched across Belgium, a small neutral country, and because the plucky and honorable Belgians delayed her, and defended their neutrality, German armies burned and looted her cities, churches, and farms. Hundreds of thousands of ruined people were driven from their homes, into Holland, France, and England. Thousands of others were killed, robbed, and enslaved. And when Belgium was shut away from trade, a little nation of seven million peaceable, hard-working people began to starve.

The first thing the children of America were asked to do was to give their pennies to the Belgian Relief Fund. The United States and other neutral countries forced Germany to allow them to send food ships to keep the people of Belgium and northern France alive.

How England Came into the War

Not only did Germany invade Belgium without any other excuse than the fact that she could thus strike France to better advantage but, together with England and the other great powers of Europe, she was one of the signers of a treaty that guaranteed Belgium's independence. England was one of the guarantors of this treaty. Moreover, the defense of Belgium was an immemorial part of this policy. Germany knew this, but counted on England's internal difficulties to keep her out of the conflict.

So England declared war, hurried an army to France, and sent her

And These Are Ear Trumpets!

If you have ever heard a flying-machine you know it is like a big blue-bottle fly—it can't get on without making a lot of noise. But the great ear trumpets in this picture can not only "hear" the buzz of the aeroplane much farther than can the human ear, but by use of them the flying machines can be located. Then the gunners open up on these unwelcome visitors with the nearest anti-aircraft guns and some of your own airmen go up after them.

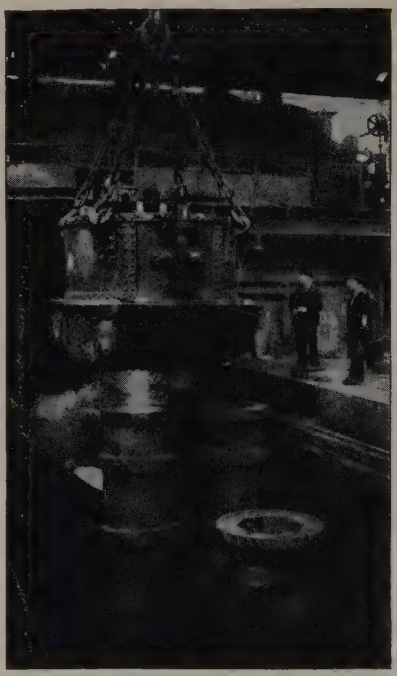
A Searchlight on Wheels

This is one of the searchlights used for throwing great beams into places which the enemy would like to keep dark, and finding out things the enemy doesn't want you to know. This particular type is very light, can be easily moved, is comparatively inexpensive, and throws a beam of large diameter a very great distance.

grand fleet of warships to cut off Germany's overseas trade. That was fair, between enemies, in war. Besides, Germany could manage to feed her own people. But it did prevent her getting cotton, rubber goods, war materials, and abundant foods from the United States, and so put her at a disadvantage.

In revenge for this blockade Germany did many forbidden and barbarous things. Her fleets of airships dropped bombs on London, Paris, and other open cities, killing women and children. She bombed hospitals, killing doctors, Red Cross nurses, and wounded soldiers. She mounted enormous cannon, far behind her own battle lines, and dropped explosive shells on cities twenty, thirty, and then seventy-five miles away. In this way she destroyed towns, and beautiful old cathedrals that she could not capture. Then, to the horror of the world, Germany used clouds of poison gas, sending them on the winds to the trenches. Thus thousands of brave soldiers were killed with no chance to defend themselves. And at sea, Germany sank merchant ships with torpedoes fired from submarines. It would have been fair to sink the ships of her enemies, after allowing passengers and crews time to take to the lifeboats and even to capture and take war materials on other ships that supplied enemy countries, if she could. But Germany sank the ships of all nations, of those that were neutral, and even friendly to her, and often without warning. In six months she sank three hundred ships, with a loss of two thousand lives. One was the American steamer "Gulflight."

The Beginning of a Big Gun



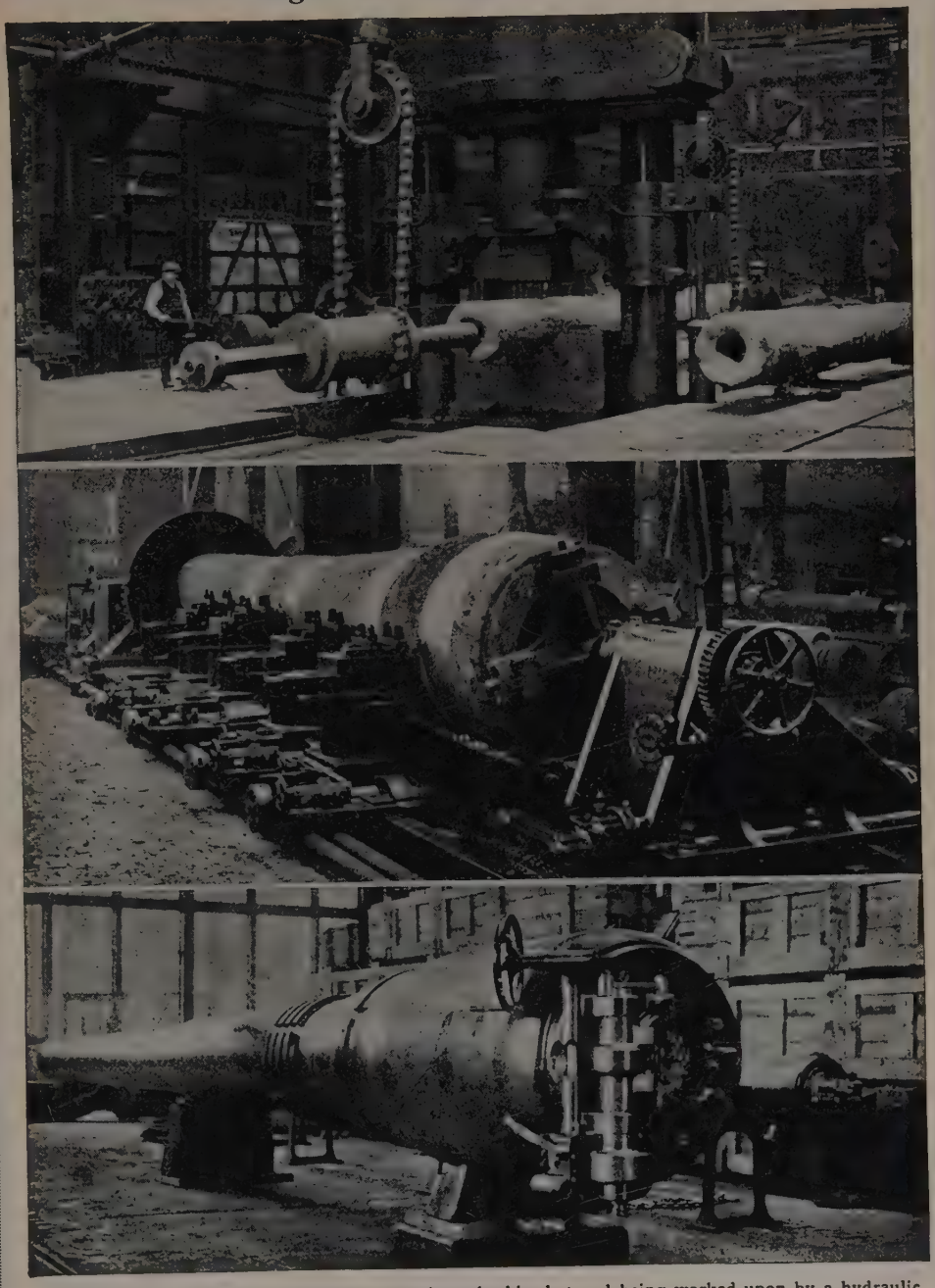
The barrel of a cannon begins as a solid steel ingot, and is trimmed, hammered and pared into a tube by huge cutting instruments. The steel of which the barrel is composed must be very pure and very strong. The picture shows the molten steel being poured from the caldron into the molds which shape it into ingots.

How We Were Forced Into the War

In May of 1915 the British ocean liner, the *Lusitania,* was torpedoed without warning. More than one thousand people, many of them women and children, were drowned. One hundred and two were American citizens.

In spite of this unheard of outrage—without precedent in modern warfare—the United States still hoped to remain neutral; to be the one great nation not involved and thus, among other things, to help in bringing about peace. She could not, however, tolerate these lawless attacks upon the lives of her citizens and demanded that Germany enter into an agreement to stop such acts of piracy and make the usual pro-

Three Stages in the Growth of a Big Gun

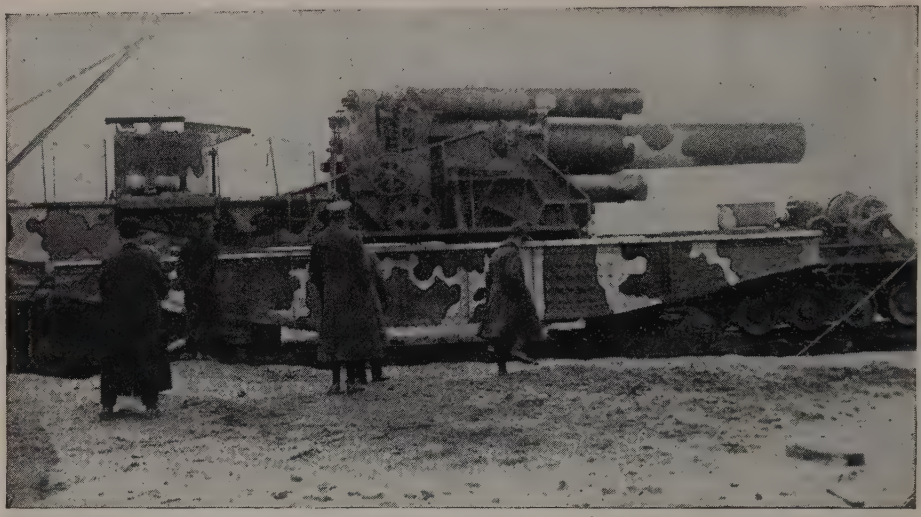


The upper picture shows the steel ingots, heated white hot and being worked upon by a hydraulic press, which shapes them roughly.

Next the big gun is turned and worked by eight cutting tools at once.

Last of all, the finished gun is sent to the examination shop, where it must pass severe tests before being declared fit for service.

A Fine Piece of "Camouflage"



Just compare the very artistic "camouflage" on this big gun with that on the dummy gun on page 1773. If you had never heard about "camouflage," and should see the two pictures, you would see that the artist—whatever he might have been up to—had taken a great deal more pains in this case than the other, wouldn't you? Don't you suppose it was because he wanted the dummy gun to be seen? You notice the bed of the car is "camouflaged" too. Such monster guns are for quick movement from place to place and so are mounted on cars, and these cars like the guns themselves are spotted in that irregular way so that they will not be so easily seen when moving across country with its various differences of surface and lights and shadows. And in passing through a wooded country you can see how these painted shadows on the gun and the car would mingle with the mottled shadows of the trees.

vision for the safety of the passengers and crew. Germany solemnly, and in due form, agreed to this, and so for a time we kept out of the dreadful conflict.

But it seemed inevitable that we should sooner or later be drawn into it. Among other things, it was learned that German spies were in this country plotting mischief and destroying property in order to stop our selling food, clothing and war material to the allies; as, of course, we had a perfect right to do. Moreover, Germany's violation of Belgium's neutrality and the sneering reference of Germany's foreign minister to the treaty guaranteeing the neutrality of Belgium, as "a scrap of paper," although she herself had signed it, made it seem very unlikely that she would hesitate to again break her word, and it was felt that we should prepare for war. Among other things, the military and naval academies were enlarged and twenty-six big new war-ships and many destroyers and submarines were ordered. President Wilson made a speaking tour of the East and Middle West, during which he emphasized the danger that we might be drawn into the war. "Preparedness parades" were held in some of the chief cities of the country with a view to letting the President and Congress know that the people felt the necessity of increasing our means of defense. Twelve hundred business, professional, and public men volunteered to go to the army post at Plattsburg, New York, to begin the training of army officers.

In February of 1917 Germany broke her promise, and began a new

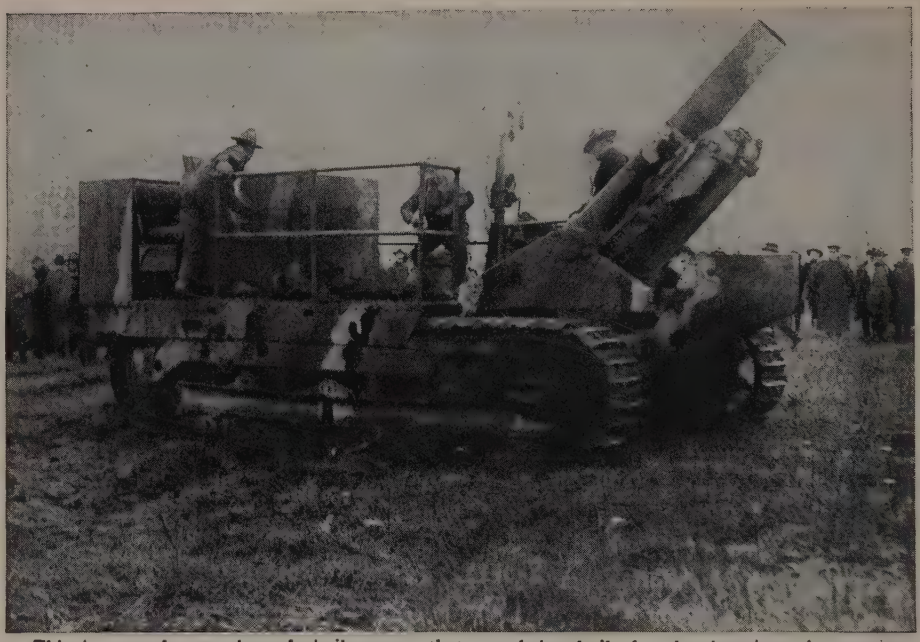
Loading One of the Big Guns

Modern cannons are mounted so that they rest well down behind a parapet or other protection, but they can be raised by machinery and aimed over the wall. The man at the left is pointing the gun at the mark. See how many men are required to do the loading.

All Ready to Fire

This huge gun is part of our coast defense. The picture gives you a good idea of the foundation on which such guns rest—a steel standard riveted into solid masonry.

A Caterpillar Traction Gun



This is one of a number of similar guns that was being built for the American Army when fighting in the World War was suddenly brought to an end by the armistice. It is called a traction gun because it is mounted on wheels and a "caterpillar" traction gun because these wheels have that steel belt with cleats on it, which enables them to climb up and down obstructions like a caterpillar. This gun and its carriage weighed fifty-five thousand pounds.

and merciless submarine warfare, sinking even hospital and Belgian Relief food ships. The United States put naval defense guns and gunners on our merchant vessels, but three were sunk in March.

President Wilson accordingly called a special session of Congress on April 2, and in the evening of that day delivered his historic message, asking that war be declared against Germany. Congress supported the course advised by the President, and on April 6 a joint resolution was adopted, formally declaring the existence of a state of war between the United States and Germany.

The navy alone was ready for duty. Our war vessels began to patrol the western Atlantic, for German submarines had crossed the ocean, and sunk ships near our coast. And a fleet of our destroyers and submarines joined the British and French in European waters, to hunt and sink the enemy undersea craft.

But about our army everything had to be done. In June General Pershing went to France in chief command of the troops of the regular army that were in the United States. Volunteers flocked to the National Guard, or states militia, which were "federalized" so they could be sent abroad. Marines and civil and railroad engineers volunteered, too. Some of our soldiers were in the trenches of France in November, some driving ambulances, some in aviation camps learning to fly, and some building training camps, warehouses and railroads from seaports to the battle front.

The Grandfather of the Wonderful Caterpillar Tank

Little did His Majesty, King George of England dream, and little did any of his soldiers dream, when he inspected this queer mechanical monster in May, 1908, that he was looking at a device which, in another form, a few years later would prove one of the greatest weapons in the hands of his soldiers for helping to win the greatest of all wars. The two chief points about the "tank," which came as such a surprise to the Germans and did such frightful execution, were that the gunners were in a steel fort on wheels and that these wheels could cross ravines, go over boulders and rocks and fallen trees—in fact, any ordinary obstruction. It was the belting device over the wheels shown in this picture, that, somewhat modified enabled them to do this. This machine is for carrying guns into action in rough country.

Abandoning the Volunteer System

But that, of course, was only "a drop in the bucket." To get a big army of the best material, quickly, the old volunteer system was dropped. All the young men between 21 and 30 were required to register, and be examined for the "selective draft." Later the ages were lowered to 18 and raised to 45. Nearly seventeen million men were registered, and plans were made for an army of four or five million. Thousands were in training in the sixteen new encampments by September, and by January ships began to carry United States troops to France for further training.

It was not only soldiers that were needed, but rifles, bayonets, machine guns, artillery, grenades, airplanes, "tanks," uniforms, shoes, blankets, gas masks, food, medical and hospital supplies, and ships. We had to turn sewing machine and automobile factories and steel mills into plants for making guns and flying machines. Spruce trees had to be cut in the forests for lumber for flying machines, and castor beans planted for oil for lubricating them. Then ten camps were opened, to train the thousands of officers that would be needed.

Congress had to pass a great many laws in haste, but its biggest task was to raise money to pay the enormous cost of the war. The United States had been spending about one billion—that is, one thousand million—dollars a year for all public expenses. Before January of 1918, Congress had spent twenty-one billion! Part of this was raised by taxes on incomes and other things, and part by the sale of government bonds. Nearly every family in America bought "Liberty Bonds."

Like a Traveling Fort

© *International News Service*

Here is an automobile carrying a machine gun. Its sides are armored like a battleship.

Inside One of the "Tanks"

Courtesy Scientific American. © *Munn & Co.*

"Tanks," as they were called, were entirely new machines of warfare introduced for the first time by the British in the European War. They proved to be one of the most important things in winning the war for the Allies. This picture shows you the inside of one of them. The gunner sat inside a revolving turret so that he could turn his attention to any point. Sitting in that belt-like device or narrow hammock, he operated his machine-gun. In front of him sat the driver with his hands on each of two levers, and his feet on the clutch pedals. The driver's work was like that of chauffeur on an automobile, but it was much rougher riding and a good deal more exciting.

A Fleet of Whippets

In the lower picture you see a row of small "tanks" drawn up, not near the field of battle but on historic Boston Commons. These small "tanks" were called "whippets." Notice the "V" on the sides. It was placed there because these particular whippets were used in stirring up people to do their full duty in subscribing for the Victory Loan. All the soldiers you see on these whippets—as you can tell from their jaunty little caps—had been over where the real fighting was going on.

Roman Methods in the World War

This page shows you, among other things, how the idea of the engines used by the ancient Romans for hurling stones and other missiles was adapted to modern conditions in the great World War. All other devices represent ways employed in the great war for throwing bombs.

Field-Guns in Action and in Hiding

PROTECTION PLATE FOR GUNLAYER'S ARM
ELEVATING SCREW MANIPULATED THROUGH BEVEL GEARING BY A HAND WHEEL AT RIGHT HAND SIDE MAX. ELEVATION 17°
WEIGHT 2160 LBS. SHELL ABOUT 16 LBS 25 TO 30 ROUNDS PER MINUTE
BREECH BLOCK
½" SHIELD PROOF AGAINST RIFLE & SHRAPNEL BULLETS
RECOIL AND RUN-OUT CYLINDERS WITHIN
SIGHTS
RECOIL 4'2"
SLEDGE
CRADLE
AXLE
HINGED SHIELD
BRAKE
HAND SPIKE
TRAIL
HAND WHEEL MANIPULATING TRAVERSING GEAR MAX. TRAVERSE
GUNNER'S SEATS
TRAIL SPADE

These two pictures show two interesting things about field-guns; the upper picture, a field-gun in action, the lower, a field gun being so placed that it can be fired without being seen. In the upper picture the gunner on the left does the sighting, and by the turning of a wheel with one hand elevates or lowers the gun, while by turning another with the other hand, he

moves it to right or left. Back of him sits another gunner whose business it is to open the breach so that the third artilleryman can slide the shell into place. He then closes the breach lock and the gun is ready to be fired. Such a big gun, as you may easily suppose, has a lot of "kick" to it, so it is provided with a device for taking up the recoil. In the rear you see the word "trail-spade," indicating a pointed projection at the end of the gun. This "trail-spade" digs into the ground, since the gun recoils somewhat (in spite of the recoil device), so that on the next recoil it can not back up any farther. The second picture shows where a gun is concealed and the limber or carriage equipment, some shells and baskets of shell cases.

The Place of the Central Brain

Underneath that crude shelter, with his maps and military plans spread on the plain little camp table before him, sat and planned the central brain of the Allied armies in the great World War, General Ferdinand Foch, Commander-in-Chief of the Allies on the Western Front. The shed was covered with a canvas curiously cut up in irregular openings and this so blended with the foliage around it that at a distance it was not observed.

We are proud that every one of the five loans, each for several billion dollars, was over-subscribed. Even the children bought savings stamps.

"War to victory!" was the cry, and everyone did what he could to win it. Men who were too old to fight and who had enough money to live on, worked for the government for a dollar a year. Men dropped their business to sell bonds. Women did, too, and they worked in army canteens and the Red Cross rooms. Eight million women knitted socks and sweaters, rolled hospital bandages and made clothing for the wounded. An army of Red Cross nurses and canteen workers went to France. In the first year three hundred million dollars were collected for the Red Cross, Y. M. C. A., Salvation Army, Knights of Columbus, and other welfare workers, besides the big sums of money and the car loads of clothing that were given to the Belgian Relief Fund and the French Orphans.

Work of America's Women

The Children and the Red Cross

The children gave all their spending money, and proudly wore the Red Cross badges. In school they learned to knit warm scarfs and wristlets for the soldiers. They sold savings stamps on the streets, and Boy Scouts sold bonds. The older girls worked in the Red Cross rooms or munitions factories; and college and high school boys worked on the farms so there would be more food to send abroad. And everyone, big and little, lived in cooler houses to save coal for the railroads and war

A Case of Camouflaged Camouflage

When a goat moth looks so much like the bark on which it is resting that its bird enemies don't see it, we call this "protective resemblance." When in war things are made to resemble other things for the purpose of deceiving the enemy, such deception is called "camouflage." For instance, that isn't a cannon at all, but a big piece of wood and the two figures beside it are dummies. Notice the difference between them and the real soldiers who happened in when this photograph was taken.

The object of this dummy gun and its dummy gunners was to draw attention away from the real gun at some other point not far away. In such cases the real gun was much more thoroughly concealed and more skillfully painted up to blend with its surroundings. You see the wooden gun is "camouflaged" in an unskillful way that would really not help to hide the gun; "camouflaged camouflaging," so to speak. They wanted to pretend they were trying to hide the gun when they really weren't!

The second picture seems to be a dilapidated old windmill but it was built that way on purpose. Inside of it are huge anti-aircraft guns.

Look Out! That Isn't a Stump

There is a man inside that queer looking thing. It is simply a piece of canvas shaped and painted to represent the stump of a tree. The man is a sharp-shooter on the watch.

factories, and cheerfully ate plain food they did not like, so there would be more white bread, meat, and sugar for the armies and for the hungry nations that were fighting beside us.

Early in the spring of 1918, soldiers, money, food, and military supplies began to pour out of the United States. England had to send transports and warships to help us get our armies overseas; and France had to supply us with the guns, airplanes, and "tanks" that we still lacked. And in return we sent them food, and loaned them billions of dollars of money. But best of all were our soldier boys. Two million of them were sent to France before the war was over.

Two Millions of Our Boys in France

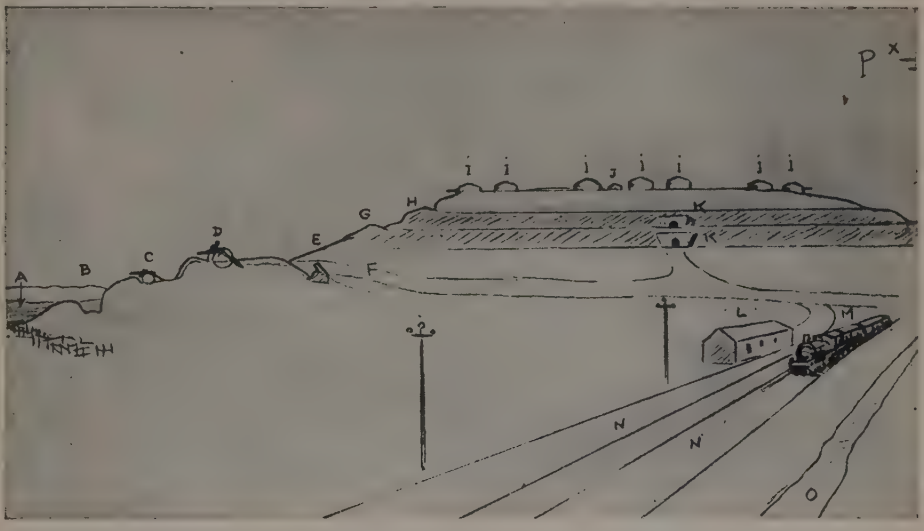
England, France, and Italy had used up nearly all their able men, and Germany, having made peace with Russia, had fresh armies to hurl against them. She hoped to win by great, smashing drives before the American soldiers could be trained and taken to France. Her submarines waited in the sea lanes to sink the transports that carried our brave boys. But our transports went in fleets that were guarded by British and American warships. And they got there in time! Just one year after the United States entered the war, American soldiers fought in their first big battle.

It would take a book to tell you about all the hard fighting of the next six months. The battle line, stretching from sea to sea, across eastern France and northern Italy, was hundreds of miles long. The soldiers from the United States were commanded by General Pershing. But all the allied armies—Belgian, English, British Colonial, French, Italian, and American—were under the command of General Foch, the military genius who was made Mar-

In the Far-Flung Battle Line

Landscape Art and the Art of War

If you met a stranger with a sketch like this, you might not think he was much of a landscape artist, but you certainly never would think his picture wasn't a landscape at all, but a picture of a fort to help aim big guns at it. Just look at the next picture and you will see!



The trees stood for gun turrets, gun positions, and so on; the gates for the entrances to the fort, the lines of bushes for ditches and the fences for a wire entanglement. In the use of such "landscape art" in war there is a regular code, so that when the picture is safe within the enemy lines it can be read just as easily as you can read a puzzle after you know all about it. One kind of tree represents an army gun turret; other forms of trees, gun positions, and so on.

shal of France. American soldiers were in several places, sometimes fighting with the English or French, sometimes alone.

We heard of them at Schieperay, in the Belleau Wood, in the champaign country, at St. Mihiel, which the Germans had held for four years, and at last in the wire-strung ravines and machine-gun nests of the Argonne forest. Fresh and strong, where others were tired and

It Meant All This When Our

This picture shows what a soldier-boy in the World War meant when he wrote home that he had been "over the top." He meant "over the top" of the trenches. This is a trench system of the Allies and an attack is being made on the enemy trenches. Such trenches run zigzag, so that the positions of the men going through them will be constantly changing, thus making it more difficult for enemy gunners to hit them. "Traverses" are sudden angles, making projections behind which men can retreat in case of need when the trenches are invaded. "Duck-boards" were for use of the men in crossing, and protected the wires of the field telephone running under them.

Ahead of the advancing men you note a dotted line

Soldier-Boys Went "Over the Top"

marked "creeping barrage." A "creeping barrage" was a device for protecting advancing troops, and consisted in throwing a rain of shells ahead of them. Such a barrage was called a "creeping barrage" because it moved just fast enough to keep in advance of the men who went forward at a moderate rate of speed.

Back of the first line of advancing troops you notice men going through a region of entanglements of barbed wire, woven around posts. These entanglements are to check the attacks of enemies. When the men in the trenches wished to advance, however, paths were opened at intervals by removing rolls of barbed wire so placed as to serve for gates.

worn, they fought with a dash and bravery that won the admiration and gratitude of the world. They furnished just the added force and spirit that were needed to push Germany and Austria out of France and Italy, and make them sue for peace.

And Then Came the Victory

No matter how small you were you never will forget the wild joy of November 11, 1918, when news came that Germany had signed the armistice, and Emperor William had fled to Holland. Bells rang and whistles blew, and people stayed up all night to sing and shout and celebrate the great peace. We were glad, and sad, too, when our soldiers began to come home, for fifty thousand were left behind in their graves in France, and many more had suffered life-long injuries.

The treaty of peace which formally ended the war was signed at Versailles, June 28, 1919. Included in this treaty was the constitution of the League of Nations. This provides a new form of international organization which by means of conferences, tribunals and arbitration seeks to prevent war and to punish any nation or combination of nations which in future attempts to disturb the world's peace.

The League of the Nations

This Peace Conference stands alone in history, not only because it ended the greatest of wars but because of this plan for bringing all peoples into one brotherhood of peace. It was also unique in the fact that for the first time in the history of the United States its chief executive left American soil to take part in it. President Wilson not only represented the Great Republic at the Peace Conference but was recognized as the chief advocate of the plan for the League of Nations and the greatest force in bringing about its inclusion in the peace treaty.

How a Law Is Made

On the First Day of the Session

After a Congressional election the Speaker of the House of Representatives must first swear in the new members before Congress can take up any business. Here is the Speaker with his right arm uplifted, administering the oath to the new members who stand in a body, facing him, with their right hands also uplifted. You can get a glimpse of the gallery, packed with people who have come to witness the ceremony.

THIS is all about "Bill," and his adventures on the way to growing up to be a law.

The Beginning of a Bill

In a republic like ours, where people can speak their own minds, every one may have something to do with bringing Bill up. This is how it is. One day a train runs into a street car. The newspapers tell a horrible story of people who were killed and wounded. People who read about it say: "Grade crossings are dangerous. There should be a law to make railroads elevate their tracks so collisions won't occur."

They talk to their neighbors about it. The newspapers talk about it. In some states, where there is what they call the "Initiative," anybody can get up a petition for such a law, and send it to the legislature. If enough people sign it, the legislature must pass it. If the legislature is not in session or refuses to pass the law that is wanted, a special "referendum" election is held, and the people pass it themselves.

The Introduction of "Bill"

But in most cities, an alderman is asked to introduce such a bill in the city council. A group of citizens may employ a lawyer to draw the bill up in proper form, or the corporation counsel may do it for an alderman. Then, one night, "Bill's" father stands up in a council meeting. Recognized by the presiding officer, the mayor, he says: "I move to introduce an act to compel the railroad companies to elevate their tracks within the city limits."

Bill is born; but he can't walk. A boy page takes the folded, typewritten paper up to the clerk's desk. The clerk reads the title again: "An act, etc." in a voice like a megaphone, so that everyone may hear what it is all about. Then he stands and reads the entire bill aloud. Some one moves that the bill be sent to the Committee on Railroads. This is a small group of members that holds special meetings to talk over railroad bills. Citizens can appear before the committee and say why the bill should or should not be passed. Railroads may say they need five, not two years, to complete the work, as the bill requires.

Reference to Committee

The committee may report that the bill should be passed as it is; or that it should not be passed at all; or that it should have certain changes made in it. Changes are called amendments. When reported back to the council, the amendments must be read three times, and be voted on separately. Then the entire bill must be voted. If a majority is in favor of it, the bill is said to be "passed." It then goes to the mayor to be signed.

In a state legislature, or the national congress, a bill must be passed by both the house of representatives and the senate, and then be sent to the governor or president. Sometimes a house bill is amended in the senate. Then it must go back to be voted on again. Poor Bill! Trotting back and forth, hustled about, doctored, battered, punched, mended and talked to death, and then started on another weary round, he must get as tired as an office boy. Then he may have to lie for days smothered under a pile of other bills, waiting to be signed. Even then the mayor, governor or president may not like Bill's looks, refuse to sign him and send him back to be altered.

If the law-makers decide to have nothing more to do with Bill, they drop him in the waste basket and he goes to feed the furnace; or they may set him up on their shoulders and, with shouts, carry him right over the chief executive's veto. That means they do not agree that the bill ought to be changed.

But when he is safely "passed," and has grown a downy mustache under his nose, Bill has to stand up and be enrolled. You know what that is like in school. You tell your name and age, where you live, your father's nationality and what he does for a living, when you were vaccinated and how it "took." Teacher writes it all down in a book. There's a committee, and a clerk whose sole business it is to enroll Bill in the law books. Any tiny mistake in writing it down, and Bill's ambition to be a grown-up Law is smashed as flat as the pin you lay on a rail for a train to run over. Haven't you done it?

The Day of Enrollment

We See the Wheels Go 'Round

© *Horace K. Turner*

This painting forms part of the wall decoration of the Congressional Library in Washington. It is over a doorway and is one of a series by the eminent American artist, Elihu Vedder.

DID you notice how the three departments of government work together? A well-managed country is like a watch with three big wheels. Each wheel is independent, but all of them fit together and turn on each other.

The mayor is head of the executive department of a city. It is his business to see that the laws are obeyed. Yet he has something to say about what the laws should be. His police, health, fire and other officers are always going about the city. They see things that should be done, or forbidden. They report these to the mayor, and the mayor reports to the city council, and advises the members. Sometimes the council takes his advice and sometimes it doesn't. But if the council passes a law of which the mayor disapproves, he can refuse to sign it. This is called the veto power. He sends the bill back with his reasons for not signing it, in writing. If two-thirds of the members still think the proposed law good, they can pass the bill over the mayor's veto.

Things a Good Mayor Does

Governors, Mayors and Presidents

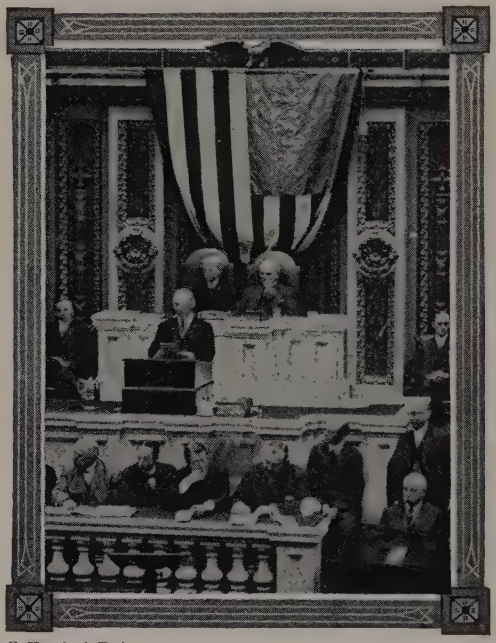
The governor of a state is in the same position toward the state legislature as the president toward congress or the mayor toward the council. It is the duty of the governor to advise the leg-

islature as to what new state laws are needed. But as he does not preside over the meetings he sends his advice in a long public letter, or message. A state legislature is divided into two bodies. The house of representatives chooses a speaker from their own number, to preside. The lieutenant governor acts as president of the state senate. All bills must pass both branches and be signed by the governor. The governor, like the president and the mayor, has the right of veto; and a bill can be passed over his veto, if enough members vote for it. Usually two-thirds is necessary.

You would find the same thing true of the national government in Washington. When a new president comes into office, and every year, when congress meets, he sends a long message to the law-makers. He reviews every important work of the government, and every question that people are talking about, and says what he thinks should be done about them. The newspapers always print the president's message in full, and citizens everywhere talk about it. Mayors, governors and the president save us from bad laws by vetoing them, and sometimes they delay or prevent the passage of good ones. They make mistakes, but we have found that the veto power is a good thing for them to have. It gives our law-makers a chance to think again, and second thoughts are often best.

Executives and the Veto Power

The President Addressing Congress



© *Harris & Ewing*

Here you see the President delivering an address to Congress. Who are the men seated behind him? You guess that one is a presiding officer, which is quite right, but what office does the other hold? Since the President is addressing Congress, that is, both the Senate and the House of Representatives, the presiding officers of both bodies are there. The one on the left is the Vice-president who presides in the Senate, and the other is the Speaker of the House. Which branch of Congress, the Senate or the House, is host on this occasion? Another question will tell you the answer. Which branch meets in a room large enough to accommodate both? The men with notebooks before them are reporters, taking down the President's speech for tomorrow's newspapers. Why aren't they facing the President? See if you can tell. These seats are reserved for reporters at all meetings of the House and in the regular sessions they will get more of what is going on by facing the members instead of the Speaker. Why? Who does most of the talking in a legislative body, the "Speaker" or the members?

The judges have something to say about some laws. As a city is governed under a charter, which says exactly what it is allowed by the state to do, so the states and the nation are governed under written constitutions, which say what they may do. Our United States constitution was adopted by the thirteen states when the government was formed; and the other states had their constitutions approved by congress, when they

The President's Private Office

© *Underwood & Underwood*

Here is the room in which the President discusses business of a confidential nature. It is in the Executive Office west of the White House. It is large and comfortable, but no more elaborate than the offices of hundreds of successful business men. The piles of paper waiting for the President's attention give you a hint of what a busy man he is, how many things have to be attended to every day.

The President's Door Guards

© *Underwood & Underwood*

This is the reception room leading to the President's office in the White House. The two guards are always here to protect the President from anarchists and other troublesome people who may get into the White House, pretending to have business with the President.

Where the Cabinet Meets

© *Underwood & Underwood*

When a full Cabinet meeting is called to discuss some question of importance, it takes place in this room. The President sits at the head of the table facing his Cabinet. The three maps illustrate phases of the European war, which the cabinet was discussing at the time this picture was taken. Under one of them is a whole rack of other maps, you see.

were admitted to the union. These can be changed only by amendment, on which all the citizens must vote. A legislature or congress cannot pass any law that is forbidden by the constitution. For instance, every one who is accused of a crime has the right to a trial by jury. That right cannot be taken away from him by a new law. There are so many things in the constitution that few can remember all of them. So, blunders are made and the courts set a law aside, as unconstitutional.

How Law Makers Check Executives

But if the mayor can advise the council and veto bills, the council can act as a check on the mayor. He appoints the chiefs of police, fire, health and hundreds of other officers, but he must send the names of the people he appoints to the council. Usually they are approved, but sometimes they are criticized and thrown out. The council can refuse to give him all the money he wants, to do the work of the city. And if a mayor or city court judge neglects his duty or breaks the law, the council can turn itself into a court and try him. If guilty it can turn him out of office. This is called impeachment.

A governor, too, must send the list of his appointments to the legisla-

Where the Biggest Wheel Is

The wheel that sets all the other wheels to going is in this building, the Capitol at Washington. It is the office building of the United States. In it Congress meets to pass laws, the President transacts official business and the various departments have their headquarters.

ture. That law-making body can impeach the governor, other state officers and state court judges. The president, vice-president, federal and supreme court judges and other officials can be impeached by the senate, or upper house of congress. The president must submit the names of cabinet members, foreign ambassadors and consuls and federal and supreme court judges and other officials to congress, for its approval. Legislatures and congress hold the purse strings. It is the law-making bodies that say how much money is spent and what it is spent for.

A Watch That Keeps Watch

Isn't that like a watch? Here are three wheels, each doing a lot of work by itself, but if they did not move with the others, and turn on them smoothly, they would all come to a stop. When you come to study the government of a big city you will also see dozens of little wheels. But they are all connected with one of the big ones. In any government, either of a small town or the greatest empire, there are only three departments. There are the men who make the laws, the men who see that the laws are obeyed, and the men who settle disputes between citizens and punish law breakers.

The Ship of State

Thou, too, sail on, O Ship of State!
Sail on, O Union, strong and great!
Humanity with all its fears,
With all the hopes of future years,
Is hanging breathless on thy fate!

LONGFELLOW

How Courts Settle Disputes

© *Underwood & Underwood*

This picture shows the Supreme Court of the United States in session. The Chief Justice sits in the center, under the eagle's spreading wings, and the eight other judges making up the court are ranged on each side. The lawyers are sitting at the tables below and one of them is addressing the court.

"THOSE marbles belong to me."

"No, they don't. They are mine."

Marbles look much alike, and each boy may honestly think the ones in dispute are his. Savage people settle such questions by fighting. The stronger always has his way whether he is in the right or not. In civilized countries, when men cannot settle their disputes peaceably, they ask a court of law to do it for them.

If you have a school city the two boys to a dispute should go before the judge and tell their stories. Others who know anything about the matter should be called as witnesses. Whichever one proves ownership should have the marbles.

In a Case of Marbles

Either boy may ask a jury trial. In that case the judge is obliged to call in six or twelve boy and girl citizens to decide the case.

There is a way to settle such disputes out of court. Each boy may chose a friend to act as his lawyer. The lawyer of the boy who has the marbles may say to him: "This is going to be pretty hard to decide. Why not offer the other boy part of the marbles? If you take the case into court, he

may get all of them." The other boy's lawyer advises his client to accept the offer, because the court might decide that none were his.

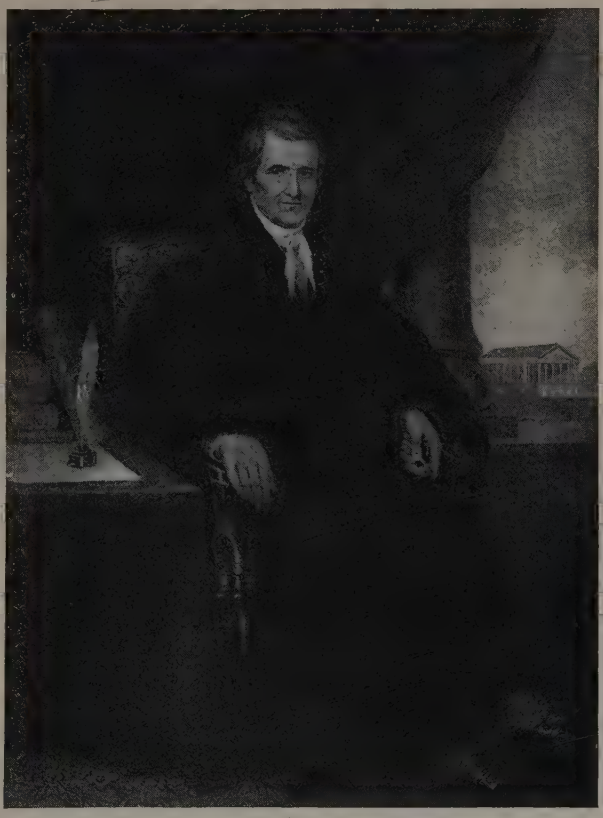
The Different Grades of Courts

In a real city or town, a legal dispute would be heard in a justice, or police court. No place is so small but it has a justice of the peace, who decides disputes involving small amounts, and fines people who are disorderly. Disputes about larger amounts of money; the distribution of property underwills; the guardianship of orphan children and the care of their property; and serious crimes, such as burglary, are settled in higher courts. In every county seat there is a courthouse for these higher courts, and a state supreme court in the state capital.

Then, there are United States, or Federal courts, which hear disputes between states, between citizens of different states, and where those who break government laws are tried. Anyone who robs a post-office, who breaks the national banking laws, who smuggles goods into the country without paying the tax on them; who sells government secrets to foreign countries; who deserts from the army or navy, or attempts to kill the president, is tried in a Federal court. Big cities have all three kinds of courts. The highest court of all, the Supreme Court of the United States, sits in Washington, and the justices are appointed by the president.

What the Highest Courts Do

Our Greatest Chief Justice



John Marshall became Chief Justice of the Supreme Court a few years after government under our constitution began. By his wise decisions and his thorough knowledge of the law, John Marshall gave people confidence in the new government and established the constitution on a firm foundation.

Let us see what happens when a case gets into court. Any civil suit can be settled out of court, as the boys settled about the marbles. But a charge of crime must be tried. A civil suit is decided sometimes by a judge, sometimes by a jury. Every man accused of a crime, for which

he may have to go to prison or forfeit his life, has the right to demand a jury trial.

The jury system was begun hundreds of years ago by the Saxons in Germany, to protect innocent people from persecution by enemies, kings and nobles. The Saxons took their jury trials to England, and English colonists brought them to America. When our government was formed, this precious right of trial by jury was put into the Constitution. Even the government cannot take this right from its citizens. It is the duty of every voter to serve upon a jury when he is called upon to do so, unless he is ill or has some other good excuse. Great care is taken by the court, in the selection of a jury of twelve "good men and true" who will give the accused a fair trial. It is a solemn moment when the judge says: "Stand up and be sworn, gentlemen."

The jury must listen to the arguments of lawyers, and to the sworn testimony of witnesses on both sides, and make up their minds from the evidence. The judge instructs them in the law. In a room by themselves they talk the case over and vote upon it. When they have made a decision they return to the court room and the foreman hands in the verdict. That is another solemn moment when the judge inquires "Guilty" or "Not guilty."

Rights of New Trial and Appeal

If a jury disagrees, a new trial is ordered. And if either party to a suit is dissatisfied he can demand a new trial. In criminal trials, the state or the United States is one party, and is represented by a prosecuting attorney. The decision of a justice court can be appealed to the state courts, up to the state supreme court. A case begun in a federal circuit court can be carried up to the United States supreme court. Many decisions of the lower courts are over-ruled or sent back for retrial by the upper ones. Great civil and criminal cases are often taken from one court to another for years. But they are settled at last, and everyone concerned is obliged to abide by the decision. Around our entire system of local, state and federal courts, countless safeguards are set, to secure justice for everyone.

Quarrels are settled by law, not by using fists. And people charged with crimes are not punished by the angry victims, or by mobs, but by the courts, after fair trials.

The judge is the presiding officer in a court. He sees that all the requirements of the law are observed in the selection of the jury, the examination of witnesses, and everything else that goes on in court.

After all the testimony has been given he reads, and afterwards turns over to the jury, a written statement called the "charge," which tells the jurymen what the law is with regard to the points in controversy in the case. The jury decides what the facts are, according to the testimony, and then gives a verdict for the plaintiff or the defendant in accordance with these facts and the law as laid down for them by the judge.

How Uncle Sam "Makes Money"

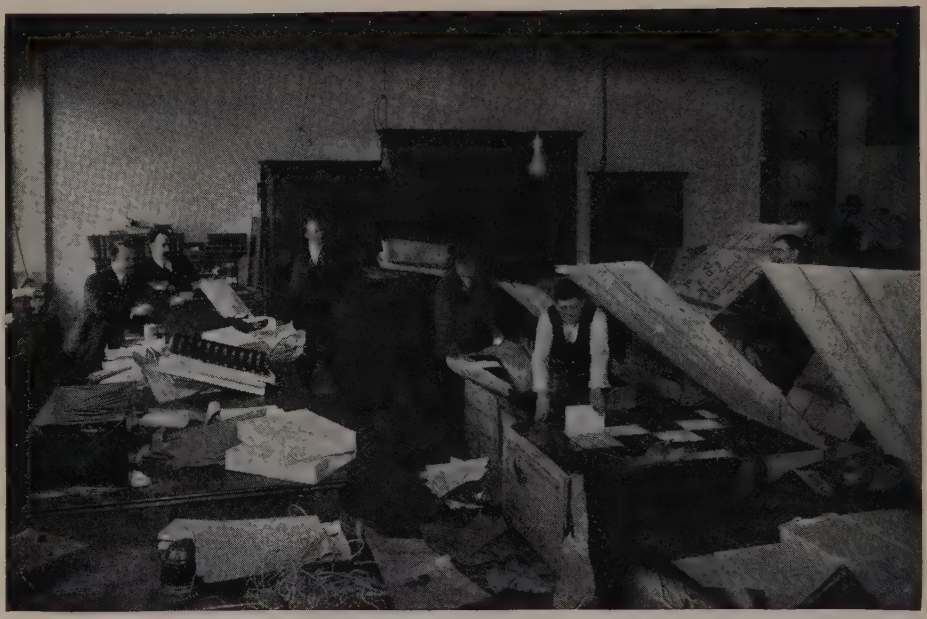
The U. S. Customs House in New York City

In large cities, in various parts of the country, Uncle Sam has offices for the men who attend to the collection of the internal revenue and the tariff on articles imported into the country. In the very largest cities, like New York, he has buildings of his own for these offices. This is a picture of the U. S. Customs Office in New York City. The sculpture groups in front of the building are by Daniel C. French. One of them, "America," we have reproduced as the tail piece to the Geography article on America. You can tell where it is by comparing the two pictures. The other three groups represent Europe, Asia and Africa. You see, we import things from all over the world. Uncle Sam's revenue officers know a great deal about Geography and it's as interesting as a story book.

YOUR "Uncle Sam," or the United States, has to spend hundreds of millions of dollars every year. But before he spends it he must earn it, just as your father earns his money. He does many things for all of us that no one could do for himself. So every one must pay him something, even children.

You think you don't give him any money? Why, every time you mail a letter you must pay Uncle Sam's postoffice two cents for a stamp. It goes to pay for the mail service. The tax on incomes is another source of revenue. There are many things you use, upon which you pay what is called an "indirect" tax, which

Inspecting Imports



These men are U. S. revenue officers, and they are examining imported goods to see whether the proper amount of duty has been levied on them. Sometimes the men who import the goods have different opinions from Uncle Sam's officers as to the value of the goods, what class they come under, and so on, and the officers have to look into this. Duties, as you know from your Arithmetic, are either levied according to the class in which the goods belong, or according to their value—"ad valorem."

goes into Uncle Sam's savings bank. On coffee, rubber, watches, dolls, and other things grown or made in foreign lands, a customs duty, or tariff, must be paid at the seaport, before they are admitted to be sold in our country. This tax is added to the selling prices of the articles.

Another form of indirect tax is the revenue tax on such things as cigars and tobaccos. Did you ever notice a long, green stamp around one end of a box of cigars? That is an "internal revenue" stamp that the manufacturer is obliged to buy of Uncle Sam. The stamps on packages and bottles are cancelled, as they are on letters, so they cannot be used twice.

Uncle Sam gets some money by selling his public lands, by renting coal and other mineral lands to mining companies, by selling timber from forest reserves, and water from irrigation ditches; and he charges a toll on the tonnage of ships passing through the Panama Canal. But for many years most of his money came from the tariffs on imported goods. When it was decided to let in necessary articles, such as sugar, free, or at lower rates, Uncle Sam had to look about to see where he could get enough money to keep the country going. By an amendment to the Constitution, which was voted on and accepted by the states, congress was allowed to put a direct tax on the incomes of citizens.

Sales, Rentals, and Tolls

How Uncle Sam Spends His Money

What does he spend all this money for? Well, he has to pay the

expenses of congress, of the president's department, of the federal courts, of the ambassadors and consuls who take care of our interests in foreign countries, and of the army and navy. He has to improve rivers and harbors, build postoffices and other government buildings.

He can pay for all these things without much trouble. But when he has a war on his hands, or a big piece of work like irrigating desert lands or digging the Panama Canal, he is obliged to borrow money. People of our own and of foreign countries are glad to loan money to Uncle Sam. They take his promissory notes, called Government Bonds. These draw interest every year and are payable in a certain number of years. Uncle Sam is such "sure pay" that his bonds draw a low rate of interest. They are as good as cash and the owner of one can sell it any day.

Uncle Sam's Pockets

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Uncle Sam cannot put all his money in his pocket for two reasons: one reason is that there isn't any "Uncle Sam," really, and another is that there is so much of this money that it would not go into anybody's pocket. So they have a lot of "pockets" for it in the shape of stout canvas bags like these. The bags, when they are filled, are put away in the vaults of the Treasury at Washington. Each of the bags you see here has a thousand dollars in it.

Now, you know, Uncle Sam runs a printing office to make paper money, and several mints for coining gold and silver. Wouldn't you think he could take what he needed, and not have to collect it from the people, in taxes, and borrow? But the money he makes isn't his. He is only the people's agent and treasurer, to supply a safe medium of exchange for carrying on the business of everyone.

Just What is Money?

What is money, after all? Why, it is what you buy things with. But *real* money must have value in itself. Gold and silver have value. Coins can be melted and sold. But a paper dollar has no real value. It simply stands for money. People use it for buying and selling things because it is more convenient than coin and they can always exchange it for coin. On a two dollar bill is printed these words:

"This certifies that there have been deposited in the treasury of the United States of America, two silver dollars."

The real money is the silver. The paper money is Uncle Sam's promise to pay its face value. Green bills are silver certificates; yellow bills, gold. National banks are allowed to issue paper notes by depositing government bonds with the treasury. Uncle Sam cannot make as much paper money as he pleases for himself or for the banks. He can make only as much as he has gold, silver and bonds in his treasury to redeem them with.

Money is printed on a special

In the Money "Laundry"

Every day is "wash day" in the Bureau of Printing and Engraving in Washington, where Uncle Sam makes his paper money. Paper money is handled so much that it is likely to carry disease germs, and before being sent out it is run through this machine which cleans and sterilizes it. Notice that the girl on the left is feeding the money into the machine which carries it along and passes it through the sterilizing apparatus until it comes out "spick and span" at the other end.

Paper Money and the Coinage

kind of paper that only one factory is allowed to make, and for one customer, and that is Uncle Sam. It is very tough and smooth, and has little red and blue silk threads scattered all through it. The bills are printed from plates of steel, beautifully engraved by hand. Each bill is numbered and is signed by the secretary of the treasury and the registrar. The seal is stamped on last. See how many things you can find on a dollar bill.

The owners of mines are willing to exchange gold and silver bars, at the mints, for these paper promises to pay, of Uncle Sam's, because his promise is "as good as gold" and the paper is convenient. The metals are melted, rolled into strips, cut into round blanks by steel dies, weighed, stamped with the designs and "milled" about the edges.

To Prevent Counterfeiting

The greatest care is taken with the paper, engraving, inks, printing, numbering, signing and sealing of paper notes; and with the minting of coins. That is done so that not one can disappear while being made; and to make it difficult for any one to alter or copy them. But clever criminals sometimes counterfeit both paper notes and gold and silver coins. Uncle Sam has secret service men, or government detectives out all the time, hunting for counterfeiters. A bad coin is duller in color than a good one, usually weighs less, the design is not so sharply cut, and when dropped it does not give the "ring" of gold and silver. Bad paper money has a different feel to

The Paper that Stands for Money

the touch. It lacks the little colored silk threads, and the engraving is not so carefully done. Often something will be missing—a number or signature.

If you should get a piece of counterfeit money, do not try to buy anything with it, as that is against the law. Ask the person who gave it to you to take it back and give you good money. He probably did not know it was bad. If you don't know where you got it take it to the nearest bank to be sent to Uncle Sam in Washington. That will help him catch the man who made it. And that is one big item of expense, to Uncle Sam—to guard our money, to make sure that every dollar paid to every citizen, for work or goods, is worth one hundred cents.

Don't you think he earns all we pay him?

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Paper money isn't real money at all, you know. It's either Uncle Sam's promissory note, or it is a certificate, saying that so much gold or silver has been placed on deposit with him. He has to have the real money in the shape of gold and silver, such as you saw in the bags, to "back up" these promises and these certificates. The colored man you see here is putting the seal on paper money done up in packages.

The Sweetest Lives

The sweetest lives are those to duty wed,
Whose deeds, both great and small,
Are close-knit strands of an unbroken thread
Where love ennobles all.
The world may sound no trumpets, ring no bells;
The Book of Life the shining record tells.
Thy love shall chant its own beatitudes
After its own life-working. A child's kiss
Set on thy sighing lips shall make thee glad;
A poor man served by thee shall make thee rich;
A sick man helped by thee shall make thee strong;
Thou shalt be served thyself by every sense
Of service which thou renderest.

ELIZABETH BARRETT BROWNING.

Where We Got Our Dollar Sign

IN every German speaking country there is a coin called the thaler—pronounced tah-ler. The people of Holland and the other low German countries say dah-ler. The coin and the name were brought to America by the Dutch who settled New York. The English colonies of New England and the South used the English coins of pounds, shillings and pence. As there were so many more English than Dutch settlers in America the name would have disappeared if it had not come to us again from Spain. The Spanish people, from a long period of fighting and trading in the Netherlands, had found it necessary to coin the thaler. They called it a "peso," but other trading nations called it the Spanish "dollar." In 1750 Great Britain sent nearly a million Spanish dollars to Massachusetts to pay war expenses. The coin was worth four shillings sixpence, or one dollar and eight cents. After the Revolution the United States adopted its own decimal system of coinage, making the dollar of one hundred cents the unit of value.

Some History Back of the Dollar

When this American money first came into use it was always referred to as United States, or "U. S." currency. Some authorities think the dollar sign ($) is an abbreviation, the S being written over the U. Others think it an abbreviation of the Spanish *pesos*. But it may also be a short form of 8/8. As our dollar is ten dimes, so the Spanish dollar was eight *reals*, a *real* being a small coin worth ten or twelve cents. The Spanish dollar was often called "a piece of eight."

But Is It "U. S." or "Pesos"

Working for Uncle Sam in the Civil Service

THE United States has more than one hundred thousand "jobs" for those who want to work for him. They are in the Civil Service, which includes every department of the government under the President's office, except the army and navy. When you are seventeen years old you could get one of these places—one of the lowest clerkships to begin with, and a chance to work up, if—

Just like any other employer, Uncle Sam wants to know some things about the people he hires. He will give you a trial if you are honest and in good health and if you can get an average of 70 in reading, writing, spelling and arithmetic. One who expects to get into the postoffice service must be good in geography; one with business college training or office experience, should ask for a bookkeeper's or stenographer's position in Washington, or a local government building. And there are a number of fine places for teachers, electricians, engineers, surveyors, chemists, draftsmen, foresters, mineralogists and specialists in plant and animal life. These are sent to the Philippine Islands, Panama and Alaska, into the irrigated lands and national parks, to agricultural colleges, and to do expert work for Uncle Sam in Washington.

Character of the Work

Under the Old "Spoils" System

All these places used to be given to men who worked to put some party in power. After every election, when the party changed, thousands of government employes were discharged. Members of the winning party took their places, often not to do the work, but to draw the salaries. No one was examined for fitness to do the work, or discharged for incompetence.

That was not business-like. As the people of the United States were paying the bills they insisted upon a change. Now, under the civil service law, government employes must pass examinations. No employe is asked about his politics, nor can he be asked to give either time or money to political work. The positions to be filled are divided among all the states according to population, and examinations are held twice a year in each state. Anyone can learn about the times and places of examination by writing to the Civil Service Commission in Washington.

The questions are prepared, not by the commissioners, but by boards of examiners made up from among employes of the departments. It was found that men in the postoffice department, for instance, know best just what a beginning mail clerk or letter carrier should know. Those who

get the highest marks are put at the head of the list, and are offered the first vacancies. Physical fitness is considered too. Crippled people often have bright minds and can do office and laboratory work well. But a forest ranger must be able to tramp and ride in all weathers, camp out, and endure many hardships. A railway mail clerk must be at least five feet six inches tall, weigh one hundred and thirty pounds and be quick of eyesight, hearing and movement. Mail cars are sometimes attacked by robbers, and the safety of money and valuables depends upon the quickness, strength and courage of the clerks.

Getting Marks Under Uncle Sam

Trying Out the Applicants

When a vacancy occurs in a department of the government the chief in charge sends word to the Civil Service Commission. Three names that stand highest, on the list of the kind of place to be filled, are sent. The first is notified to report for a six months' trial. If his work is satisfactory he has a permanent position. He cannot be discharged except for good reasons that must be reported in writing to the commissioners. Anyone who gets a place under Uncle Sam not only has a life job if he does his work well, but he can win promotion. Mr. George B. Cortelyou started as a stenographer in a department. He was such a good one that he was sent to the White House, to write President Cleveland's letters. He became private secretary to President McKinley, filled three cabinet secretaryships under President Roosevelt, and was made chairman of the Republican National Committee.

The Case of Cortelyou

There are other chances in the Civil Service besides those of promotion. Washington has good schools of law, medicine, engineering and other professions. The hours in government offices are short. Young men and women earn money to finish their education. After graduation they go into other businesses for themselves. Forty thousand vacancies are made every year, in this and in other ways, making room for a new lot of ambitious young people who want to work their way through college.

Stepping Stones for Other Work

Many states and cities now have their own civil service systems for state and city employes. Citizens saw how much better the work of the schools, libraries and postoffice was done, under the merit plan. They are now insisting that policemen, firemen, health officers, managers and attendants in institutions and hospitals, and all public employes, except those who are elected, should come under civil service rules.

What do you think about the civil service idea?

How Uncle Sam Helps Us Save Money

A Postal Savings Bank

It's just as it says on that notice between the two windows: "This Postoffice is a Postal Savings Depository." The reading matter on the notice tells just what to do in putting money into a postal savings bank and taking it out. The man on the left is putting money into the bank, and the one on the right is taking it out. You know—or will know when you have read this story on how Uncle Sam helps us to save money—that "to get money out you write on the back of the certificate the amount you want to draw, and sign your name."

UNCLE SAM has been peeping around corners for years, watching big people and little ones spend pennies, nickels and dimes for foolish things. "Dear, dear! This won't do, at all," he said, and sometimes he whispered in their ears:

"Why don't you put the money you don't need to spend into a savings bank?"

"There is too little of it; the bank is away down town; and besides, banks sometimes break. Besides, I have an old stocking, or a hole in the ground, for my savings."

"And never earning a penny! At Washington I have a silver dollar that was buried fifty years, and is green with mold. In a savings bank it would have earned two dollars in that time. The banks do care about pennies, for they grow into dollars, if put to work. And it is not the amount of money saved that is so important, as the habit of saving, and the business training of keeping accounts, and counting the cost."

Establishment of the Postal Banks

So Uncle Sam thought he would better help his boys and girls, and people who haven't the banking habit, to save money. You can open a savings account with a ten cent piece, at a postoffice. The postmaster will give you a card with spaces to stick nine ten cent savings stamps on. When you present the tenth dime he will take your card up, and make out a postal savings certificate for one dollar. He will write your name and address, and the date. If you keep that certificate a year, you could draw out one dollar and two cents. The postmaster keeps a copy of the certificate, so if you lose yours he will give you another one. To get money out, you write on the back of the certificate the amount you want to draw, and sign your name. If you have saved $10 and want to use $1, the postmaster will give you the dollar and a new certificate for $9, bearing the same date as the one he takes up.

How the Postal Banks Work

What does he do with your money? He puts it into a bank, and draws three per cent interest on it. The extra one per cent pays him for the trouble of taking care of your money. When you have saved one hundred dollars, you should draw it, after an interest date, and put it into a bank, where it will earn more money. Uncle Sam will not let you leave more than $500 with him. He does not want to go into the banking business, but to get people into the habit of saving.

How Your Uncle Trains You

Uncle Sam can tell you a lot about saving money and investing it, and how it grows. One hundred dollar boxes of candy are eaten up, and earn nothing but headaches and bad teeth. But a one hundred dollar bond, that can be turned back into cash any day, earns from two and a half to five dollars a year. It would pay for your tuition and books for a year, in a business college, or give you a start in life when you grow up. And you would have the saving habit, instead of the spending habit.

This saving habit is one of the most important things you can learn.

What the Government Does for the Farmer

West Wing of the U. S. Department of Agriculture Building.

NO OTHER person has so many different kinds of things to do as the farmer—and Mrs. Farmer; so many hours of work. Up at four o'clock in the morning in summer, he feeds the farm animals, milks the cows, doctors a sick horse, sprays the fruit trees to kill insects, hoes the garden, and "bugs" the potatoes. He plows and sows and reaps, cares for his machinery, hauls his crops to market, and looks at the weather reports in the postoffice. Then, when everything on four legs has gone to bed, he reads the farming papers and the crop and market reports.

You won't be surprised, then, to learn that one of the busiest men in the President's cabinet in Washington is the Secretary of Agriculture, who is the government farmer. Just to name the departments under him, each with its chief and hundreds of employes, makes an ordinary man's head swim. Two of them, the Weather Bureau, and the Bureau of Forestry, we have told about in separate articles. There is, besides, a Bureau of Animal Industry, a department devoted to grasses, grains, fruits, flowers, and truck gardening. The Bureau of Chemistry studies fertilizers. The Soil Survey has mapped the country, according to what each of over four hundred different soils will grow. The Bureau of Biology collects information about useful and harmful wild birds and animals. The Bureau of Entomology does the same with insects, and the Bureau

A Bee Hive of Bureaus

of Statistics gathers and publishes reports on the condition of crops.

"Unhired" Help From Washington

Any farmer can get any kind of help he needs in managing his farm. The Department of Agriculture will tell him what is the matter with any field and how to remedy it. It will send him printed bulletins of directions to cure all plant, and animal, and soil diseases. It will tell him why ichneumon flies and moles are friends. It will send him samples of seeds suited to his farm, tell him how to test and select seeds, and what other crops he could grow to make more money. In one swampy district in Maryland the government advised the farmers to breed muskrats for the fur. They did so and are now prosperous.

Government experiment farms are conducted, often in connection with state agricultural colleges. The pupils analyze soil, test seed and fertilizers, and attack insect enemies and plant diseases. The healthiest plants are marked and the seeds saved for replanting. Strong plants are vaccinated with disease, so they won't catch it. The same attention is given to farm animals, to breed the biggest and strongest. Just as malaria and yellow fever were caused by certain mosquitoes in Panama, so investigation by Uncle Sam's great farming

Vaccination to Keep Plants Healthy

TICK ERADICATION PAYS.

After being freed of ticks, this Mississippi steer gained 285 pounds in 2 months, an average daily gain of 4¾ pounds, under the same feeding conditions.

TICK-INFESTED STEER.
August 12, 1911. Weight, 730 pounds

SAME STEER FREE OF TICKS.
October 12, 1911. Weight, 1,015 pounds.

The Federal Government, in cooperation with State and local authorities, is engaged in eradicating ticks which infest cattle and transmit disease. Individuals can help by freeing their own cattle of ticks, and by urging their neighbors to do likewise. The ticks are usually destroyed by dipping.

Literature and information may be obtained from the—

BUREAU OF ANIMAL INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C.

How Uncle Sam Makes the Ticks Stop Ticking

Nothing "talks" like a picture. So the Department of Agriculture—the division of it called "The Bureau of Animal Industry"—sends out posters like this into the cattle regions where cattle become infested with ticks, to teach the stock raisers how well tick-eradication pays, and how to make the ticks stop ticking! This picture tells at once the results of doing it, and the reading matter under it tells you how to get full information about tick-eradication by writing to the Bureau of Animal Industry. These posters are displayed in the local postoffice and other public places.

An Arizona Date Orchard

As we have seen, it has been proved that dates will thrive in this country. This scene is in the hot, dry Arizona climate. The picture shows date trees three years after transplanting.

department proved a "tick" caused Texas fever in cattle. By studying the habits of Mrs. Tick, and protecting cattle from her, Texas fever is being stamped out.

By giving plants certain foods and exposing them to heat, cold, drier and moister air, they are trained to stand new climates, so they can be grown more widely. And new seeds are brought from other countries and "naturalized." A fine rice was introduced from Japan into Louisiana; a dry-region wheat from Asia Minor; a seedless grape from Italy; the olive tree from Spain; a hardy peach tree from China, and a fig tree from Smyrna. At first the fig tree did everything it should but grow figs. To fertilize the blossoms a certain wasp, with a long honey tube, was needed. So fig wasps were brought over, too, to California.

A Bit of Egypt in California

This date palm does not seem to know it is not in Egypt, for it goes right on producing dates in California as its parent tree used to do in the Land of the Nile. It was imported by the Department of Agriculture because the experts of the "Division of Pomology" thought it ought to grow in our own beautiful "lands of Egypt," like southern California.

Any man who thinks of buying a farm, anywhere in the United States, should write to the department in

A Chrysanthemum Show

A chrysanthemum show of the Agricultural Department. Compare the development of the chrysantnemums on the right with the seedlings on the left.

Vegetable Trial Grounds

Here we are in the vegetable trial grounds of the Office of Seed and Plant Introduction. This big garden is on the flats of the Potomac. Here, experiments are made with different kinds of vegetables, and those that prove the most satisfactory have their seeds sent out for use of farmers and gardeners all over the country.

How the Date Palms Got Here

This picture shows how slips—scions, they are called—from all kinds of fruit trees are brought from different parts of the world for introduction in this country. These packages are called "mailing cases."

Washington. It will analyze the soils of the farm, give him reports of the climate, the crops and markets of the region, what fertilizers to use, and what other things of greater value he could grow.

It will tell him the rations and treatment of animals, how to run a market garden, a fruit, dairy, poultry or timber tract. It will tell him where to put his house and stable, how to dig a dry cellar, a pure water well, drain a wet field, build a silo, to "pickle" green fodder. It will tell him what machinery to buy and how to take care of it. And it will tell the farmer's wife and children many ways to lighten toil.

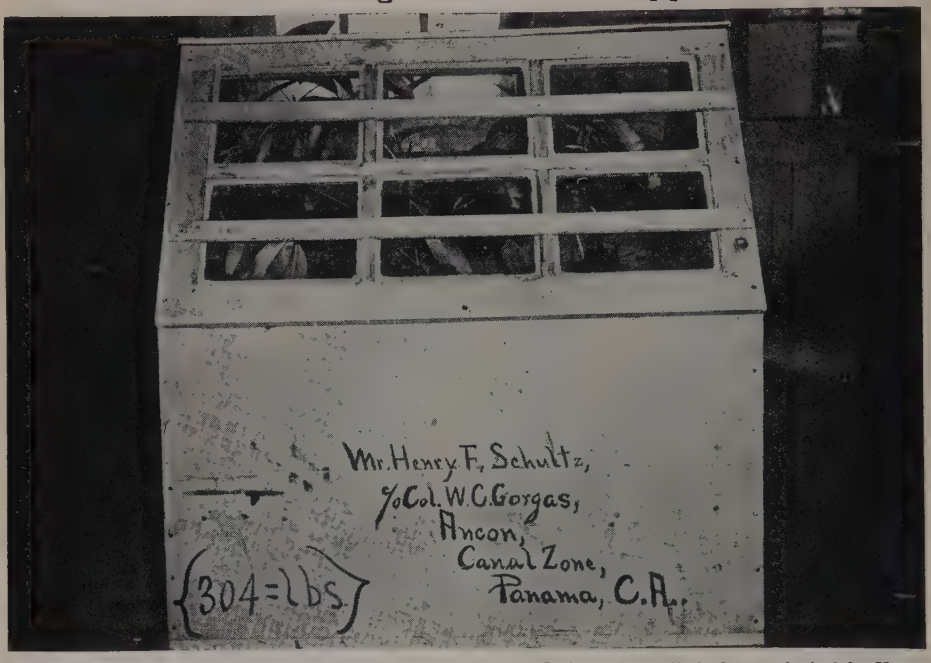
Catching the Farmer Young

Our government likes to catch its farmers young, and train them. That is because boys and girls take to new ideas quicker than older people. There are many thousands of boys in Uncle Sam's Corn Club. One boy in South Carolina is the champion corn grower of the world. In the Canning Club are thousands of girls. Farm girls are making money by canning fruits and vegetables that once went to waste.

Getting Rain When You Want It

One of the greatest things the Agricultural Department has done is to water the rainless deserts. The

How Young Plants Are Shipped



Here is one of the boxes in which plants are shipped. It is really a little house, isn't it? You see where these plants were going, don't you?

dry regions often have rich soil. With water they grow enormous crops. Often, right above them, the mountains are snow covered. But the melting snows made floods in the spring and left the land to parching suns. Only Uncle Sam had money enough to build great dams across the outlets of mountain valleys, to hold the waters back until needed, and to dig miles of irrigation ditches. Now, whenever a farmer needs rain, he opens a water gate and fills the little ditches that cross his fields with water.

The government helps the farmer at the "business" end of his business. It tells him how and when to market his crops; how to keep books, figure labor cost and interest on the value of his property. It advises him to keep separate accounts of each field and animal, so that he can tell which is making a profit and which is not. Many farmers never realized that it costs the same to till a poor field, feed a "scrub" cow, and grow a worthless apple tree, as to care for a good one, until Uncle Sam proved it to him over and over.

Everybody is glad to see all this help given to the farmer, because the more he knows and grows, the more and better foods we will all have to eat. But it is just as important that everything offered in the market should be pure and wholesome. So the Agricultural Department has a pure food bureau to inspect oyster beds, packing houses, creameries, canneries, and storage houses. Manufacturers who adulterate foods or put false labels on packages can be prosecuted in the courts.

It costs millions of dollars to run

Establishing Grades of Cotton

This is the laboratory in which official grades of cotton are prepared. Cotton of a certain quality is designated by names which are understood by the trade, such as: "Fair"; "Strict Middling Fair"; "Middling Fair"; "Strict Good Middling," etc. The trouble is that when men sell cotton to one another they may dispute, when the cotton is delivered, whether it is up to grade or not, so the government establishes grades and sends samples of these grades to the various cotton exchanges.

Uncle Sam's big farming department, and it doesn't make a penny—it gives everything away. But don't you think, like Little Orphant Annie, that it "earns its board and keep" and a good deal more?

A Pleasant Home for Beautiful Sheep

This is a scene on a government experiment farm at Middlebury, Vermont. It shows a group of Southdown sheep. On these experiment farms the government finds out about animals as well as plants, and gives the benefit of this information to the farmer and stock raiser.

Uncle Sam's Best Customers

BY "UNCLE SAM" you know, is meant the people of the United States. All together we are a sort of storekeeper, buying goods of other countries and selling them. We grow more wheat, corn, cotton, and other farm products, and make more oil, iron, flour, machinery, and other manufactures than we can use. And other countries have things to spare that we need. We grow no coffee or tea, but think how much we use. We do not make enough linen or silk goods, nor certain kinds of cotton and wool fabrics. All of our spices, many tropical fruits, diamonds, laces, ostrich feathers, sugar and countless other useful and beautiful things come to us from far away lands. Thousands of ships are on the oceans, carrying goods back and forth. Trains take them to and from the seaports.

How We "Swap" with Other Nations

You and Your Papa and Uncle Sam

If your papa is a storekeeper, how much business does he do in a year, and how much money does he make? Buying and selling, Uncle Sam does a business of over several billion dollars a year. You know, if you earn a dollar and spend a dollar and five cents, you are in debt, but if you spend only ninety-five cents you have a nickel to put in your toy bank. Uncle Sam usually buys less than he sells. That is what makes ours a rich country.

A Billion Dollar Business

England buys the most from us. Before the dreadful European War she bought over $478,000,000 worth of goods in nine months, and sold us over $234,000,000. Canada bought $300,000,000, and sold us $90,000,000; Germany bought $268,000,000, and sold us just half as much; France bought $120,000,000 and sold us $113,000,000. Our next best customers were Holland, Italy, Belgium, Cuba, Japan and Mexico. As you see, in some countries we sell a great deal more than we buy. But in Brazil we bought $104,000,000 worth in the same nine months, and sold that country only $32,000,000. We spent two and a half times as much money in China, and twice as much in Cuba and Japan as those countries spent with us, and the same was true of all the countries of South America. Now that the Panama Canal is opened we are selling more in South America and Asia.

Some of Our Best Customers

How Uncle Sam's Business Grows

Our trade is growing larger every year. That gives railroads and ships more goods to carry. Our trade is changing, too. To feed our increasing population, and give work to more men, we have to keep more of our foodstuffs and raw materials of manufacture at home. Sixty per cent of what we sell is manufactured, only 40 per cent unprepared foods and other raw materials.

Using Up Our Raw Materials

What Our Government Is Doing for the Children

UNTIL 1912 the government did nothing for the children.

If a cow had Texas fever, a chicken the pip, a hog cholera; if corn, wheat, potatoes or apple trees had some disease or insect enemy, Uncle Sam could tell the farmer exactly what to do about it. He even counted every bushel of the grain crops and every domestic animal, and reported their market value. But of the farmer's or townman's children he kept no account and he gave the mothers no help in bringing them up. Poor baby was born to troubles, as sparks fly upward. He scrambled up or gave up the struggle with no help, without even the knowledge of good Uncle Sam.

Julia Lathrop, Chief of the Children's Bureau

Oh yes, he cared. But it didn't occur to him that anything more could be done about it. He just seemed to think that as every child was born with two loving parents he would be provided for properly. It was the business of each county and state to care for its own orphaned, blind, deaf and feeble-minded children. In early days, when healthy living was easier and cheaper in our country, most children did grow up naturally, into useful, happy men and women. But even then all mothers were not wise, and all fathers did not do their duty.

The Cry of the Children

And now, thousands of babies are born every year in the crowded quarters of big cities. Their parents love them, but they are poor, ignorant and helpless. The food and air of the little ones are poisoned. Their bodies and minds are stunted by too early

toil in factories, mines and shops. Their innocent hearts are poisoned in alley and gutter playgrounds.

Cruel Waste of Childhood

Child offenders were judged by the same hard codes as grown-up criminals. In jails and prisons and poorhouses they mingled with adult law-breakers, paupers and the feeble-minded.

A few such people as Jane Addams and Julia C. Lathrop of Hull House, Chicago, Judge Lindsey of Denver, and Nathan Strauss and William George of New York found all these things out, and told the public.

"Do you hear the children weeping, oh my brothers,
With a sorrow not of years?
They are laying their young heads against their mothers,
And that cannot stop their tears."

Just as Mrs. Browning got the factory laws of England changed long ago by writing the poem from which this verse is taken, these social missionaries in American cities got the first pure milk depots, day nurseries, fresh air homes, public playgrounds, vacation schools, juvenile courts and better child labor laws. It was Miss Lathrop who, for a dozen years, insisted that this waste of childhood was Uncle Sam's business. The babies of today are the citizens of tomorrow. They must do the work, bring up the next generation, invent, discover, keep our liberties, and preserve the home. What kind of citizens was the government allowing to grow up?

Beginning of Reform

Miss Lathrop knew exactly what she was talking about. As a member of the Illinois State Board of Charities for twelve years, she had visited every poorhouse, jail, factory, orphanage and institution in Illinois. She had secured the civil service law and helped Miss Addams establish the first juvenile court in the world. She insisted that every child born has a right to be registered, his food and air, education, morals and work guarded and regulated. He has a right to have his mother taught how to care for him and to have his father punished when he deserts the family.

In April, 1912, President Taft approved an act of congress creating the Bureau of Child Welfare under the Department of Commerce and Labor, in Washington. Miss Lathrop's appointment as the first chief of the bureau was widely approved.

Just what does this bureau do? It cannot make laws for the nation, state or city. Its duty is to collect and publish facts of every kind that relate to the well-being of children, and give information and advice on the best laws and methods. It studies the birth rate, death rate, the causes and prevention of children's diseases. It tells people the weight and measurements of a physically perfect child, how to tell mental and moral qualities and to correct defects. It reports the records and results of schools, institutions, juvenile courts, apprenticeships, healthful and harmful first occupations; and how to get and enforce good child labor laws and to punish those who corrupt or exploit children for profit.

In a word, Uncle Sam has gone into the business of giving the children a "square deal" and of making better and more useful citizens for the future.

How a Foreigner Becomes a Citizen

Two Little Newcomers from Holland

Hans and Gretel have arrived at Ellis Island, the gateway through which all European newcomers must pass. Gretel's one-legged dollie must be clasped tight by two chubby arms for it is very precious, and Hans is ready to defend his small fat sister most valiantly in the new strange land. America may some day be proud of this adopted son of hers who stands so staunch and scowling in his two wooden shoes.

"IN the United States you can live and work where you please. You can think and speak your mind freely. You can send your children to public schools."

Something like this is printed in newspapers, all over the world, in many strange languages. We are so used to having these blessings that we think little about them. But to many foreign people who come to America, to make new homes, they seem too good to be true. They are not here long before they learn that they can become citizens, and

help manage the affairs of our great country. A newcomer sees the happy excitement and the feeling of responsibility of his neighbors over an election. His fellow workmen will tell him how he must go about it to

that he is of good character and is not an anarchist—that is, a disbeliever in all governments. He is given his "second papers" and is told to appear in court at the end of ninety days to be examined.

Just from Holland

Here is the whole family for three generations—a baby, his young mother and father, and his grandmother. They are strong, clean and intelligent-looking and will probably make good citizens.

become one of Uncle Sam's business partners. He should go before a judge and take a solemn oath that he intends to live in the United States and become a citizen. The clerk of the court writes out his declaration and gives him a copy.

First Steps Toward Citizenship

Five years after landing in this country and not less than two years after his declaration he takes his copy of the declaration into any federal court. Two citizens must go with him as witnesses. To his petition for full citizenship they must sign their names to the statement that the man has lived in the state at least a year,

What the Witnesses Are For

Could You Answer Such Questions?

This time he must prove that he can speak and read English, and that he understands our system of government. Questions are asked him about our history, and the government of cities, states and nation that would puzzle some of our native born voters to answer. If the judge is satisfied that he will make a good and useful citizen, a "certificate of naturalization" is made out. That is the foreigner's diploma. It makes not only the father, but the mother and the children still under age who were born abroad, citizens. Children

Children Are Citizens Too

born here are citizens whether the father is or not.

It used to be easier for a foreign born man to become a citizen. But then it was unfair to make a boy born here, of American parents, wait

Graduating into Citizenship

tion and civics, or practical government. In Massachusetts, when a class of aliens is graduated, a meeting is held, with the mayor as chairman. A judge makes a speech on

Only One Shipload of Immigrants

Most of the immigrants to this country come in the steerage of the big Atlantic liners because the fare is cheapest. This is just one shipload. It gives you some idea of how fast foreigners pour into "The Promised Land," and how important it is they should learn about our institutions.

until he was twenty-one to vote, while aliens were allowed to vote within a year or so. Besides dishonest politicians used such voters to cheat in elections. Honest but ignorant foreigners were paid for voting as they were told. They were made to understand that vote buying was a good American custom.

Corrupt Use of the Foreign Vote

Naturalization Night Schools

In some big cities there are now "naturalization" night schools. The pupils are men who have taken out their "first papers." They study speaking, reading and writing English, American history, the constitution and civics, or practical government. In Massachusetts, when a class of aliens is graduated, a meeting is held, with the mayor as chairman. A judge makes a speech on good citizenship, and bearded men sing: "My Country 'tis of thee" with proud hearts.

One of the first things many foreign born Americans do, when they get their citizenship papers, is to pay visits to their old homes. Some of them come to us upon reaching the age when they would be obliged to serve in the standing armies of Russia, Germany, Italy and other countries. If they went back before becoming citizens of the United States, they would be arrested and punished, and then be made to serve as soldiers. But with their "naturalization" certificates, they can come

Our Consular Courts Abroad

At Ellis Island

This man has gone to sleep on a bench at Ellis Island while waiting his turn to be examined. Since people from other lands began to come to this country in such numbers, we have gained some very undesirable citizens as well as some good ones, and have become more careful about the kind of immigrants we admit. We don't want those who are diseased, insane or feeble-minded, criminals or anarchists, so all immigrants are stopped at Ellis Island, just outside of New York Harbor. There they are examined and tested, and sent back to their own country if they are found to be unfit.

and go as they please. If molested in any way, they can appeal to the nearest American consul. It is one of the duties of our consuls and ambassadors in foreign countries to protect traveling Americans in their rights, and to assist them in their troubles. When a man can say: "I am a citizen of the United States," he is treated with every consideration.

Work of the Consuls

Americans who are living or traveling in other countries must, of course, obey the laws of those countries. Uncle Sam will not defend his citizens who commit crimes elsewhere. But, in very backward nations, where there are half-barbarous punishments, and imperfect means of getting justice, American consuls keep the right of judging Americans in their districts, and do not leave them to the mercy of native courts. They settle disputes of captains and crews of American merchant vessels, and they take charge of the body and property of any American who dies. If a citizen of the United States is imprisoned unjustly in any foreign land, the whole department of state is set in motion to secure his release. If necessary, Uncle Sam's soldier boys would go to his defense.

The Man Without a Country

Every boy and girl should read Edward Everett Hale's story of "The Man Without a Country," to learn just what it would mean to have no native land; to be a homeless wanderer, like poor Phillip Nolan. And then read the story of the author's ancestor, Nathan Hale,

Schoolfellows in New York City

The upper row of boys are: James Radin—Swedish, Nicholas Vasbaro—Greek, Max Rose—German, Samuel Blickman—Russian, Chin Chung—Chinese, and Philip Adler—Scotch. The boys in the lower row are: Israel Hellman—from Austria, William Kleinberg—from Australia, Samuel Blum—from Canada, William Simon—from England, Michael Iorio—from Italy, and Philip Rotter—from Roumania.

who was captured by the British in the Revolutionary War, and hanged as a spy. His statue stands today in a crowded quarter of New York City. On the pedestal is one of the first English sentences foreigners learn. It is what this young American patriot said on the scaffold:

"I regret that I have but one life to lose for my country."

How a Big City Is Managed

IF a country boy had but one wish, wouldn't it be this, to visit a big city?

A boy who is born in a city and who grows up there, never sees it as a country boy does. It's like that story of Christmas every day in the year. Even the animals in the park zoo are an old story to the city boy. But to a country boy, a city is a fresh wonder. Such a maze of tall houses and endless streets! Rivers of people, automobiles, cars. From the top of a skyscraper they look like distracted ants. But it would look rather terrifying to the boy if he wanted to cross the street.

The Procession and the Policeman

"Want to get across, sonny?" A blue policeman, six feet high and two wide, speaks to him.

"I—I was waiting for the procession to go by."

"You'd stay there long enough to grow a gray beard." The policeman laughs like good old St. Nick. He lifts his hand, and the procession stands as stock still as grandfather's clock.

To a stranger it looks as though a city is wound up and stopped by policemen. But the officer on the crossing has his orders from the Chief of Police. The mayor appointed the chief, and got his power to appoint from the city charter. The charter was granted by the state legislature and approved by the people. The people elected the mayor. If that procession does not stop, when the policeman tells it to, disobedient ones can be arrested and taken before a judge of the city court. The law was made by the city council. Isn't that exactly like your school city, with the three departments, or wheels of governments, turning on each other and working together?

And just as in your little government, the work of the council and the courts is done in quiet rooms, out of sight. But the mayor's work of enforcing the laws is public. You run into his army of helpers everywhere.

Division of Duties in a Big City

On any street you may see a police patrol wagon, a fire engine, a street sweeper, a city hospital ambulance, a park water or oil sprinkler, or a school-board automobile truck. A "Measles Here" card on a door, or "No Spitting Allowed" sign in a street car, shows where a health officer has been. A wagon loaded with garbage or ashes is driven by one of the street-cleaning brigade. Then, in every elevator, a sort of diploma looking paper is neatly framed. It is the inspector's certificate of safety. Butchers' refrigerators are inspected for cleanliness. Weights and measures in stores wear the city sealer's little honesty pasters. Dogs wear license tags, and automobiles and peddlers' carts are numbered.

Departments of a City's Work

There are police, fire and health departments, school and library boards, park commissioners. Any boy would find a lot to interest him in the engineering department. That builds and repairs bridges, viaducts, water-works and harbor improvements. There is a building bureau, a water bureau, a bureau of streets, a bureau of sewers, a board of examiners of stationary engineers and plumbers. Nearly every department issues licenses and permits of some sort. Ignorant people could endanger others and damage property, in many occupations. Every engineer, plumber, chauffeur, operator of a moving picture machine, bridge tender, seller of fireworks and oils, and many others must have licenses. And special permits must be got to hold parades, put up circus tents, build a house, and lay a sidewalk.

Handling the City's Money

To carry on the business of a large city takes millions of dollars every year. In a family, father earns and collects the money, and mother may be treasurer for the household. The city gets its money from taxes, licenses, permits, inspectors' fees, water charges and court fines. All money goes first to the city collector. He gives it to the city treasurer who puts it in banks, and sends receipts for money paid out to the city comptroller, or bookkeeper. The comptroller and treasurer sign checks, or city warrants, for all money paid out. That is how the policeman gets his salary.

Work of the Law Department

A city has a lot of work for lawyers to do. There is a corporation counsel to draw up bills properly for the law-makers, and to advise every department in disputed questions. The prosecuting attorney is really a state officer. He sees that criminals are punished in the local courts, but under the state laws. The city attorney defends the city against damage suits.

The City Hall is a big building, several stories high, and often covering a block of ground. Sometimes the courts have a separate building. In the City Hall is the council chamber with its committee rooms, the mayor's office, the offices of various chiefs and boards. Some departments take a whole floor. With several thousand schoolteachers and more policemen, you can imagine that the city's employes would make a good-sized town. People having business with the city, come and go all day at this City Hall.

Work That Never Stops

Even when you are in bed, the patrolman's footsteps by your door, the measured toll of the fire alarm, and the clamor of horses and engines, remind you that the city government never sleeps. By a telephone call you could get a policeman, a fire company, or a hospital ambulance any hour of the night A park squirrel in its bark house in an oak tree, or a bird on its nest in the shrubbery could get help, too. No one is allowed to hurt these little creatures. It is the duty of park policemen to see to that.

A Little City in a School

This picture shows an Indian reservation school in which a pupil government is being organized. One of the boys is reading aloud the constitution, upon which the other fathers of this new republic will vote, section by section. The self-government idea makes a strong appeal to our young red brothers.

THERE is one story that is in every school history. It is the story of the Charter Oak. The charter was a written permission from the King of England, for the people of the Connecticut Colony to govern themselves. Afterwards the king changed his mind. He sent a royal governor to rule the colony. But the charter was safely hidden in a hollow oak tree in Hartford. The governor went away in a great rage, and the colony continued to govern itself.

The Granting of the Charter

City charters are given today by the legislatures of the states. If you want to form a school city the first thing to do is to hold a mass meeting, and get up a petition to the principal, asking for a charter. It should be signed by as many as possible of the upper grade pupils, who would become citizens. The principal may want

you to go to the superintendent. Read the article on "The Children's Club." It will tell you how to get things started, and then how to carry on your government properly.

Swearing in the Officers

Here is a group of the officers of a school city being sworn in. They are declaring that they will faithfully perform their duties, and from the look of them I believe they will. Don't you? Everybody is holding up his or her right hand except the boy on the left. I wonder why that is? You notice, also, that "Siberia" is in the northern part of Asia, and other things that make the schoolroom look so nice and "homey." This is a school in Newark, New Jersey.

A committee on the charter should present the petition, and tell the principal or superintendent why they want self-government, and why they think they can keep order and get the school work done properly. Do not complain if your charter is limited to one term, at first. Remember, you are on trial and may fail. But won't you work to show that you can be trusted!

Planning the Form of Government

You would better write out the kind of charter you want. By studying the United States Constitution in the back of your school history, upper grade pupils could put it in proper form. It should state: first, the name of the proposed city; second, its purpose; third, what powers the city is to have; fourth, who are to be citizens. In our real government a young man cannot vote until he is twenty-one, nor hold important offices until he is older. The pupils of the three higher grades should be full citizens. Those of the Fourth and Fifth Grades could have the right of applying to the court for citizenship papers. But before admission to citizenship they should be examined in reading and writing and tell what they understand about the charter. Pupils in the "baby" grades are minors. They must obey the laws, but must be protected from bullies on the playgrounds, from dangers at street crossings, and be helped in other ways. Fifth, your constitution should name the offices

to be filled, times of elections, and duties and terms of officers should be stated. The principal looks the charter over, and perhaps suggests some changes. When the charter is

sides over the council meetings but has no vote. Any citizen may attend a council meeting, but can take no part in the debate. He should watch the member from his ward,

A Trial in School

Of course, school is full of trials—we all know that—but this is a court trial. The scene is in a school in Cuba where they have pupil self-government. The culprit looks very sorry and the jury looks as if it would not be severe. But the law must be obeyed! Notice the banner, "Cuerpo de Policia." That is the way they say "chief of police" in Spanish.

signed it is adopted by the vote of citizens at a mass meeting.

Exactly as in a real city, state, or nation, the government of a school city is divided into a legislative, or law-making department; a judicial, or law-judging department, and an executive, or law-enforcing department. In a city the council, or board of aldermen, makes the laws.

The Wards and the Town Councils

To elect a council the city must be divided into wards. There should be a ward for each class. Each ward elects a member to represent it in the council. The mayor and judges are elected by popular vote of all the citizens. The mayor presides over the council meetings but has no vote. Any citizen may attend a council meeting, but can take no part in the debate. He should watch the member from his ward, however, and see that he is doing his duty. When the council passes a law it should be signed by the mayor. A copy is written out by the clerk and sent to the court. Judges must know the laws and the penalty for breaking them, so that they can settle disputes and punish law breakers. The mayor appoints policemen and health officers, to help him enforce the laws. Guardians of younger children are appointed by the court.

Laws to Be Enacted and Obeyed

A school city should have laws forbidding fighting, bad language, bullying younger children, truancy

and tardiness; sauciness to teachers; the marking of buildings, sidewalks and fences and littering of the school grounds or streets with rubbish; personal untidiness and rude manners. stay in your seat for two days at recess, and think it over. I am sorry to say it, but if there are any more complaints about you, you must have a guardian to call for you and

This Comes of "Playing Hookey"

Here a little truant has been arrested by one of the school city policemen. The boys on either side of the doorway seem to be enjoying it. It's all good-natured, of course, but experience shows that when boys themselves start out to stop truancy they do it. This is a scene in a New York City school.

There should be, for a truant officer, a boy who is big, kind, and firm enough to go out and arrest those who "play hookey." The culprit should be brought before the court which sits every day at three-thirty.

"Stand up, prisoner," says one of the judges severely, although she may be a dimpled girl. "You are charged with playing truant. Are you guilty?"

"Y-yes ma'am."

"What a dreadful thing to be an idler and shirker. Do you want to grow up that way? Idlers are no credit to this school, and you interfere with the work of other pupils and of teacher. You are sentenced to

The Judge Passes Sentence

see that you come to school."

The sentence is written out and signed by the judges, and the truant officer takes it to the boy's teacher. That boy finds public opinion against him. If he wants to have a good time in that school he must mend his ways.

If a boy or girl comes to school unwashed and uncombed, with dusty shoes or without a necktie, a health officer is after him. A tardy pupil is shamed out of his loitering by having a guardian. A bully is hustled from the playground by a squad of police, and made to stay away until he promises to behave. A pupil who falls below a certain standard of conduct and scholarship may

be deprived of his citizenship. This is fair, for one who cannot govern himself must be governed by others. Our big United States does not allow a tramp, a criminal or a pauper to vote. But it is seldom necessary to be as severe as that

Plenty of Work for Citizens

But you must not think that all the business of pupil government is the punishing of offenders. As you know, a real city provides parks and playgrounds, and policemen to help children and old people over bad crossings. So, in the school, the big boys and girls protect the little ones, and teach them new plays. They tie neckties, hair ribbons and shoe strings, loosened in play; they scrub grubby little faces and hands. Each room tries to see which can keep its wards the cleanest. There are ink-well, coat closet and blackboard squads to help the teacher. If a pupil is puzzled about arithmetic, the teacher asks for an older pupil from another room to help him after school hours. Everyone is ambitious to be among the best and most helpful citizens. An election comes around every term, and any one may be chosen mayor, a judge or councilman, or be appointed a police or health officer.

Helping One Another

When this story was read to a Seventh Grade girl in a city school, she said: "Any school children who could do all that would have to be 'angels bright and fair.' "

Wasn't she surprised to learn that one of the most successful pupil cities is in a big building on the lower East Side of New York? The little citizens are poor Italian immigrants, who come from crowded tenements. Don't you think they will understand how to be big citizens when they grow up?

A Republic of Boys and Girls

Taking the Oath of Office

The President of the George Junior Republic takes an oath similar to that taken by the President of the United States when he goes into office. Here you see him taking his oath, his left hand on the Bible and his right hand uplifted. He is elected by all citizens (both male and female) who are fifteen years old and have lived in the Republic one week or more. He has the right to veto laws, so he must be some one in whom the citizens of the Republic have confidence, some one who will have the best interests of the community at heart.

YOUR dictionary will tell you that "junior" means a younger person. Then this must be about a young people's republic, and that is a spic-and-span, brand new kind of a story, isn't it? Mr. William George thought it out. First of all, he bought a pocket-handkerchief-sized country—very likely at a bargain sale—for he had almost no money at all. He just had an o-rig-i-nal idea. All he needed to work it out was a farm of two hundred and forty acres at Freeville, New York.

Little Nation on a Big Farm

And several hundred neglected and naughty boys and girls. He needed them, too.

It is a tiny copy of a city government—this George Junior Republic. The citizens are from sixteen to twenty-one years of age. They hold town meetings, as the Puritans did in old colonial days. They elect a president, or mayor, and a judge. They make their own laws. To help him make people obey their laws, the president appoints policemen and

Citizens at Work

The citizens of the Republic who are most interested in farming, can earn their living there in that way. Besides the boy with the team in the foreground, two more boys can be seen in the background, hoeing a field planted in garden truck.

health officers. The judge tries anyone accused of breaking a law, and fixes his punishment. Everyone who is well is obliged to earn his living. He is paid, and he buys what he needs, in George Junior Republic money. There is a lot of fun, too, and that is free; the citizens are as busy, happy and well-behaved as the people of any grown-up country in the world.

That government is something like Topsy in "Uncle Tom's Cabin." It wasn't born, it "jes' growed." Mr. George didn't start out with the idea of founding a republic. All he meant to do was to give a vacation in the country to some of the poorest children in New York. He had been a country boy himself. He felt sorry for children who had never tramped over fields and through the woods, gone fishing, dived into the "ol' swimmin' hole," gathered wild flowers and petted farm animals. He was so happy when a big newspaper got railway tickets for fifty children, a relative loaned him an old house, and farmers offered him wagon loads of food free of charge.

How Our U. S. Was Born

A Fine Time for Two Weeks; and Then—!

The children had a fine time for two weeks, and went home in good clothing and with baskets of country dainties.

But they had behaved dreadfully. They had fought and used bad language. They had trampled gardens, broken fences and robbed orchards. They were untruthful, disobedient and ungrateful to Mr. George. Wouldn't you think he would give up in discouragement?

But he *didn't!*

Next year he took more children to the country. In a few years he

was running a camp all summer, his boy and girl guests coming in relays, for two weeks each. But they seemed to grow worse. They began to criticize their food, and to ask what they were to get to take home.

"There, that's enough. You will work for your gifts, or get no more," said Mr. George. He felt he had been doing them more harm than good. They were getting to be lazy, thankless, saucy beggars.

The Village of the Republic

Notice how neat everything looks, from the straight furrows of the plowed field at the left to the barnyard in the distance at the right.

That summer a garden was put in, a road graded, fences and buildings painted and repaired. When busy they were happier and they behaved better. Besides they were proud of what they earned. The farm began to look so nice, that everyone "pitched in" to make it still nicer.

Discovering the Joy of Work

Some pigs and chickens were bought and cared for. A cow was given them, then a rattly old spring wagon, and a tired horse that those boys fed and groomed and soon had as frisky as a colt. How each set of children did hate to go home! Never before had they had such good times. One thing troubled Mr. George. Some of them still misbehaved. Punishment did no good. A few boys stayed with him on the farm, all winter, and he thought and thought until his head ached.

One of the Cottages

At first the citizens lived in boarding-houses, but now they live in cottages like this one, at the head of which is a "house-mother." The house-mother here is standing on the steps.

The George Washington of the Juniors

"I have it," he said, one night. "I can't manage these unruly children, so they must manage themselves. I'll found a republic of boys and girls."

Wasn't that a funny idea? To let children govern themselves because they were unmanageable? But the Junior Republic was a success, from the word "go!" That was in 1895. There is a village of buildings on the farm, now, and many live there all the year around. A big boy meets

Where Visitors Are Entertained

This is G. J. R. inn, where visitors are received, served, and entertained by the citizens of the Republic. The citizens are proud if it, and take pains to keep its lawn well trimmed and the premises clean, that the visitor's first impressions of the Republic may be good ones.

visitors at the trains with a carriage. He slaps his sleek horses with the reins and says, "Gid-dap!" like a real farmer. They go at a spanking trot over a half-mile of fine road that was made by the boys. The visitor registers in a cottage hotel, and tidies up in a room made neat by a sixteen year old chamber maid. Then he goes out to see the farm village that is governed by children.

There is a schoolhouse, a post-office, a bank, a department store, a laundry, a carpenter shop, a bakery and kitchen, a dressmaking and millinery, and a tailor and shoe-repair shop. The sleeping-rooms and dining-room are in cottages, each with a house-mother. Work is being done in fields and shops, stables and kitchen. In the evening there is fun. The girls give a party, or the boys a show, with such funny "stunts" that people come miles, and pay to see it. Saturday afternoons there is a ball game and a picnic.

Business and Picnics

Governing is going on, too. A health officer directs the work of cleaning stables, pens, poultry yards, and the carrying away of kitchen garbage. A policeman arrests boys who quarrel or use bad language, or anyone who throws paper or other litter about. In the court-house a judge fixes the punishment, according to law. A very unruly boy may be locked up all day to think things over, or be made to wear a suit of striped bed ticking and work under police guard. To rebel does no good. He has no one to sympathize with him. Everyone knows his punishment is just, and public opinion is against him, as a bad citizen. The president of the republic lives in the village, and he has the right to veto unwise laws.

Why the Girls Wouldn't Get Supper

One evening, at a town meeting in the schoolhouse, an eight-hour labor

law was proposed. The girls voted against it. They said they could not get three meals a day, when they were wanted, and clean up after meals, in eight hours. But there were more boys than girls, so the law was passed. The boys went to work gaily, the next morning. They thought how fine it would be to quit early and have a long evening for play. But—

The Boys' Hotel

Not so fine as the one provided for visitors, but very comfortable, is this boys' hotel.

"Where's supper?" they asked. The girls were dressed up, playing tennis and croquet, reading in shady porches or taking naps in hammocks. They were *very* sorry, but it was unlawful to work more than eight hours. They had got up at half past five to prepare breakfast. They had put in *their* eight hours long ago.

Another American Revolution—Almost!

"But we've *got* to have supper!"

"Now see here," said the girls. "If this law can be broken, so can others. Then where would this fine government be? And if you think eight hours for boys and fourteen for girls is right, why you are going to have a first-class revolution to deal with. So there!"

A town meeting was called at once, and the eight-hour law was repealed. But that night the boys had to help get supper and wash the dishes.

A Republic of "Bad Citizens"—Made Over!

The citizens of the George Junior Republic are those Mr. George invites, and those that are sent by the courts and by parents. The first week a newcomer is a visitor. After that he is a citizen, and the first law is: "No work, no grub." Time spent in school counts, for work—which may seem rather odd, because it's so much fun to go to school, isn't it?—and the younger ones spend more time in school than at work, but they have to behave and attend strictly to business, or a guardian is

A Cottage Living-Room

This is the living-room in a girls' cottage. Simplicity, cheeriness, comfort and good taste are to be found here. Don't books and magazines give the room a home-like look?

A President and His Cabinet

Citizens of G. J. R. believe that the government can best be carried on with the help of women, as you see by the fact that the President has chosen two to serve in his Cabinet.

A Court Trial in the Republic

Trials are carried on in the Republic in the regular way. The responsibility of governing themselves and punishing fellow-citizens who break the law, develops respect for law in the young people of the George Junior Republic. They make good citizens when they grow up. Here you see a boy witness being sworn in.

In the Bakery

The girls of the Republic do the sewing, laundry, cooking and other housework, but the boys bake the bread and cakes.

The Boys' Furniture Shop

Besides farming and baking, the boys of the Republic do carpentering, plumbing and printing. These are three busy workers in the furniture-making and repairing shop.

The Schoolhouse

There is a good school in this little nation. Besides the grammar grades it has a good high school, the graduates from which can enter the best colleges in the country, without examination.

sent for. Each younger child has an older one for a guardian, appointed by the court.

A boy of eighteen will do without things to buy a new suit for his adopted brother of ten. A big girl will wear a shabby dress because she knows her baby sister will look "so

The Gymnasium Building

Among other attractions that the Republic has to offer is the well-equipped gymnasium shown here.

A Boy Storekeeper and Some of His Customers

A store where the citizens of the Republic learn the value of money, a thing which many grown-ups have to learn by sad experience after they have passed entirely beyond parental guidance and control.

Where the Boys Learn Printing

This is the George Junior Republic printing shop and some of the citizen printers at work.

sweet" in new pink hair ribbons.

When a boy leaves he can change his G. J. R. money into United States money at the bank, and take his savings home. Life, in this little republic, is as much like the grown-up world outside as possible.

The Chapel

Since the citizens of the Republic are of all nationalities and creeds, the religious services of the Republic are of no particular denomination. Besides the general services there are Jewish and Catholic meetings for the children of those faiths. Going to church is not required of citizens, but it is compulsory for prisoners and convicts.

There are now Junior Republics in other places. Besides this, many other institutions for young people have adopted some of the George Republic methods. And in some of the penitentiaries the methods of reforming young people in the George Republic have been successfully applied in making better men out of adults who have been sent to prison for offenses against the law; so it helps men as well as boys.

Democracy in Schools

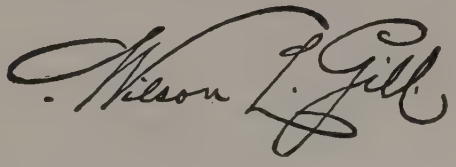
Various elements of the laboratory method of training in citizenship have been used by isolated teachers, for hundreds of years. These elements were for the first time assembled, used systematically, and persistently advocated and developed for use in all schools, to raise the level of civilization throughout the world, in 1897, in New York City.

There were then organized eleven hundred children from five to fifteen years of age as citizens of a democratic government, in the form of a city with a school city charter. They elected a mayor, president and members of a city council, a judge and minor officers in these three divisions of government. The mayor appointed health, police and other officers, whose appointments were confirmed by the council, which consisted of girls and boys, one of each from each room.

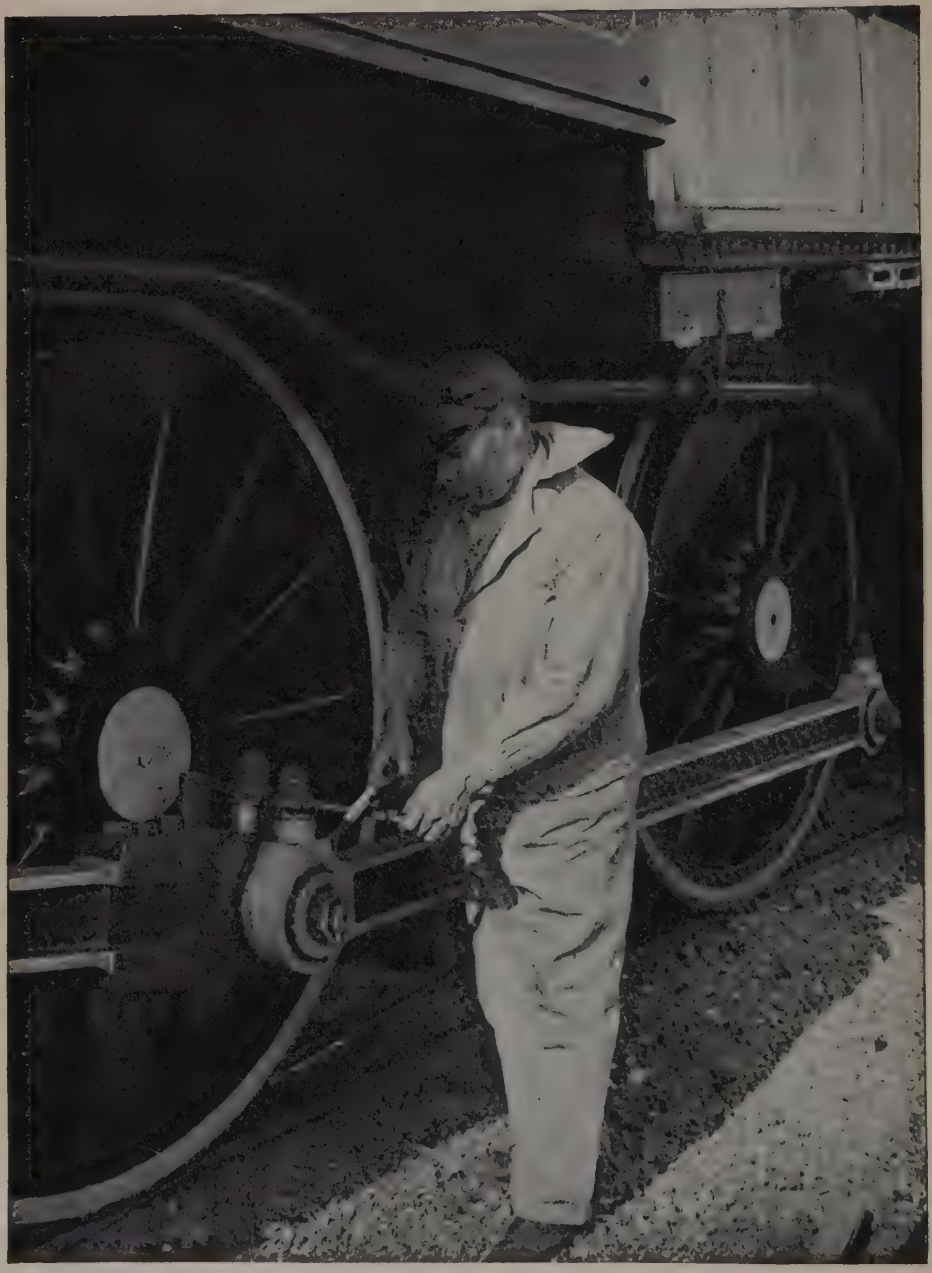
They made laws and performed the various functions of citizenship and government, under the instructions of the principal of the school, who was not a part of this republic, but teacher, guide and friend, encouraging the citizens to think and act independently and in co-operation for the defense and development of their personal and collective rights and duties. Every act of the republic was subject to his approval. He did not relinquish any part of his authority, but a new authority—that of the children—was established, which co-operated with him for every good purpose, strengthened his authority and broadened his view as well as the view of the pupils.

When the principal died, or for any other reason was replaced by another principal who did not appreciate the method, it was dropped. To meet this defect, schools are organized as a village, town or city, the teacher having the same relations to the schoolroom government as the principal had to the school republic for the entire school. The whole body of children in the schoolroom may act as their legislative body, and this is better than for them to elect a representative legislative council. If the teacher fails to maintain her teaching standards, the children's interest ceases. It is the same in teaching the practice of citizenship. For this and other reasons every state legislature should include the teaching of correct practices of citizenship in its list of compulsory subjects. Every scrap and crumb of responsibility in the school and community that can be handed over to the pupils as citizens or officers should be conserved for this moral, civic, educational purpose. It should be recognized that the use of the Golden Rule, in all of the affairs of life, personal and public, is necessary for the full success of any democracy, and that fully ninety-nine per cent of all normal boys and girls are essentially good, even if some of them by their environment have become wrongfully mischievous or even dishonest. Any reasonable appeal to them to take up the responsibilities of citizenship will be responded to earnestly, but the teacher must help them to maintain their interest, as I have already said.

Several schoolroom governments may form a state. And several states, a school federal government. This method has been promoted by the United States government and by the governments of several other countries, and is used by schools in constantly increasing numbers in our own and other countries.



Caring for His Iron Horse



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"The engineer 'must really love his iron horse,' and see that it is cared for. After a fast run his engine is as tired as he. It must be cooled, cleaned, oiled, and rested in its stall in a round-house."

The Driver of the Iron Horse

"Tested in thousands of midnight battles, always in front, on the firing line, the engineer of the 'limited' is one of the great heroes of peace."

EVERY little boy thinks he would like to do something exciting and dangerous when he grows up. He wants to be a trapeze performer, an animal trainer, a balloonist or birdman. At least *most* boys do. Don't you? He wants to be the engineer on the "limited."

Oh, *I* know; *I* know a boy who used to do it. Every day, when the "flier" *"toot-too-toos!"* a warning from the crossing, he used to rush to the station to see the train thunder by, the engineer's head out of the cab window, the fireman throwing coal under the boiler, and the bell clanging!

The Engineer's Hard Training for Work

How You Climb into the Engineer's Cab

You would like to be that engineer? Let's see if you would. It isn't all "peaches and cream"—this being an engineer. It takes a man of long training; one who has climbed slowly from train boy or yard helper, to brakeman, fireman, freight and local passenger engineer. It takes a man who can keep his mind, his eyes, ears, nose, and hands "on the job" for hours at a time: one who can

think and act as quickly as a boy in a match game of baseball.

To be such an engineer you would have to give up a lot of things. The driver of the night express must sleep when other people are awake, and often away from home. He must not drink liquor, for railroads have found out that drinking men cannot be trusted with engines. He must love his iron horse, and see that it is cared for. Engineers love their engines as if they were alive.

In the Engineer's Cab

"You know how still an engineer stands at his post. One hand grips the throttle, the other is above the air-brake. He looks at the steam gage, then out of the window. He slows the train to round a curve, opens the throttle to climb a grade, shrieks a warning before every turn and crossing; watches for semaphore lights at stations and switches."

And the Iron Horse Gets Tired!

After a fast run his engine is as tired as he. It must be cooled, cleaned, oiled, and rested in its stall in a roundhouse, and then be properly watered and coaled. Trusting no one else, he goes about with torch and oil can, filling the cups and polishing the brass work of his snorting steed. Climbing to the cab he tests the air-brakes.

"Fs-s-s-sss!" goes the air. The air-brakes are the hard bits to pull the fastest train up standing in a quarter of a minute. The train is off on the second, with its sleeping, dining, and chair cars filled with travelers, and its mail and express cars filled with valuable property. Hundreds of lives are in the care of the man whose hand is on the throttle.

Until the train is out of the station yards there is a confusion of red and green signals and glaring headlights, plumes of steam and smoke and caverns of black shadows. Up in a tower, a switchman pulls levers and guides the train through a tangle of switches, standing engines, and cars. Such a noise of bells, whistles, hisses, clatters, crashes—like artillery on a battlefield! Then the "limited" is out in the open country, rocking a mile-a-minute over a slender ribbon of steel rails.

You know how still an engineer stands at his post. One hand grips the throttle, the other is above the air-brake. He looks at the steam gage, then out of the window. He slows the train to round a curve; opens the throttle to climb a grade; shrieks a warning before every town and crossing; watches for the semaphore lights at stations and switches.

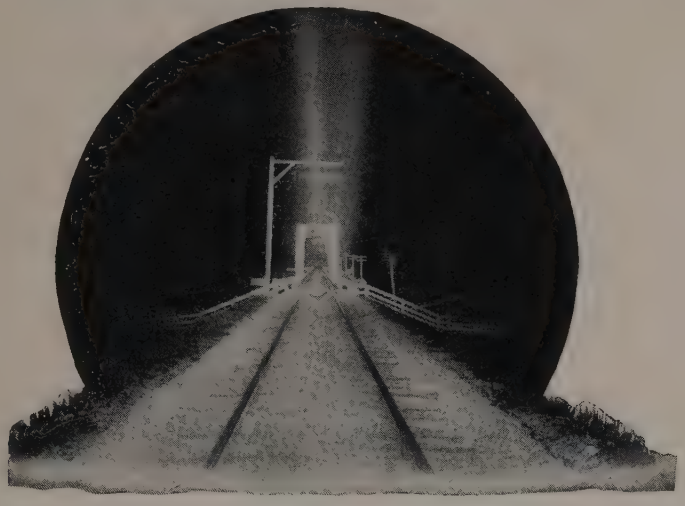
Steady! Look Out Mr. Engineer

Around double curves, over rocking bridges, along rails glazed with ice and heaped with snow, in wind and rain and fog, darkness and blinding storm he must "make time."

Any minute he may face death. A loose spike, a spread or cracked rail, a landslide or washout, a bridge weakened by flood, an open switch, a wrong or mistaken signal, a lost minute or an accident to another train, may cause a terrible wreck.

Often he might save his own life by jumping, but the engineer sticks to his post. The work is a terrible strain. For fifteen or twenty years, a man trains for it. Then in five, ten, or fifteen years he must go back to slower engines, giving place to a younger man. Tested in thousands of midnight battles, always in front, on the firing line, the engineer of the "limited" is one of the great heroes of peace.

But He Never Thinks of His Own Life



Clear the Track

"At night, with the one huge eye of his iron horse, the engineer can see the track ahead almost as well as in the daylight. Imagine yourself with the engineer on a night run. This is how the track would look ahead of you. That streaming light falls in the track from above you, as you sit in the cab and look out. Those little streamers hanging from the projecting arm to warn brakemen, who may happened to be on top of a freight car, that the train is about to run under something, and they must get down."

The Spring Walk

These simple verses, as will be seen, are not written in model English but they are interesting, not only because of the picture they give of the attractions of a country walk, but because they were written by a Scotch basket maker who learned to read and write in order that he might express himself about the things in Nature that so appealed to him.

We had a pleasant walk to-day,
Over the meadows and far away,
Across the bridge by the water-mill,
By the woodside, and up the hill;
And if you listen to what I say,
I'll tell you what we saw to-day.

Amid a hedge, where the first leaves
Were peeping from their sheaths so shy,
We saw four eggs within a nest,
And they were blue as the summer's sky.

An elder-branch dipp'd in the brook,
We wondered why it moved, and found
A silken hair'd, smooth water rat
Nibbling and swimming round and round.

Where daisies open'd to the sun,
In a broad meadow, green and white,
The lambs were racing eagerly—
We never saw a prettier sight.

We saw upon the shady banks
Long rows of golden flowers shine,
And first mistook for buttercups
The star-shaped yellow celandine.

Anemones and primroses,
And the blue violets of spring,
We found whilst listening by a hedge
To hear a merry ploughman sing.

And from the earth the plough turned up
There came a sweet refreshing smell,
Such as the lily of the vale
Sends forth from many a woodland dell.

We saw the yellow wallflower wave
Upon a mouldering castle wall,
And then we watched the busy rooks
Among the ancient elm-trees tall.

And leaning from the old stone bridge,
Below we saw our shadows lie,
And through the gloomy arches watch'd
The swift and fearless swallows fly.

We heard the speckle-breasted lark
As it sang somewhere out of sight,
And we tried to find it, but the sky
Was fil'd with clouds of dazzling light.

We saw young rabbits near the wood,
And heard a pheasant's wing go "whir";
And then we saw a squirrel leap
From an old oak-tree to a fir.

We came back by the village fields
A pleasant walk it was across 'em,
For all behind the houses lay
The orchards red and white with blossom.

Were I to tell you all we saw,
I'm sure that it would take me hours;
For the whole landscape was alive
With bees, and birds, and buds, and flowers.

THOMAS MILLER

The Structural Iron Worker

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An Iron Worker's Bird's-Eye View of New York City.

ONE of the greatest pieces of work to be seen in a city is the putting up of the steel skeleton of a skyscraper. Just as great a sight is the building of a high steel bridge across a river, or a mountain gorge. People stop in crowds to watch girders and beams that weigh tons being lifted four hundred feet in the air. Often a workman rides on the foot-wide iron "timber" that seesaws in the air and swings in slow circles. He holds lightly to the lifting chain with one hand. As he nears the top he waves signals to men on the dizzy iron spider web. They pull on guide ropes and swing the clanging monster to its lofty bed.

Dizzy Work at Dizzy Heights

Building and the Builders

The skyscraper deserves to rank among the greatest engineering achievements of mankind. The "cloud-capped towers" which were merely a poetic dream with Shakespeare have become a reality and it has been well said that since the Egyptians built the pyramids, nothing so astonishing, so daring in conception and execution has been raised by the hand of man as these giant buildings of our great cities.

The Skyscrapers and the Tenements

You often see these magnificent office palaces going up alongside the most squalid tenements. The ground which is so valuable for business buildings for that very reason becomes undesirable for residences, and so the old rows of tenements are allowed to stand and are rented to the poor until it is desired to clear the land for some big building like that on which this man is at work.

"To France is conceded the palm in modern architecture," said a distinguished Frenchman as he looked out over New York City from the tower of the Singer Building shown in our first illustration, "but France must yield to America in architectural engineering. What gigantic structures and yet you build these great edifices of steel more rapidly than we build cottages of wood."

Since the possibility of such buildings was first conceived, a special school of architects and architectural engineers has developed, and everything down to the minutest details is planned before the foundation is begun. As soon as the plans are completed, orders are sent to the steel mills, the beams are rolled and punched and in part riveted, blocks of stone for the foundation are ordered from the quarries, brick and terra cotta baked for the outer shell of the building and floors, and within an incredibly short time after the material arrives, a building of fifteen, twenty, twenty-five or more stories springs up as if by magic.

But with all the brains and skill that have been applied to the skyscraper, no one has yet thought of a device or invented machinery that will do away with the perils to which men must daily expose themselves in putting the building together; and the wonder of the building as an engineering achievement is less than the wonder of the skill and daring of the builders.

The life of the structural iron worker is one of constant danger. He must climb up and down criss-crossed iron shapes, at all angles,

Riding on the Pulley Block

Photos by Brown Bros.

"He must ride girders, pull guide lines, hitch the loads along to balance them and lower pulley blocks."

Passing the Monkey-Wrench

A man clambering about in these skeletons of buildings that are to be, frequently has occasion to borrow tools from a fellow workman. "Jack, let's have your monkey-wrench," says Bill; as you might say to a chum, "just let me have your knife a minute."

Matching the Girders

This picture shows two workmen matching girders; that is, getting them ready to fasten together. While one of them holds the girder in place, the other drops a "pin"—as the iron workers' long handled steel bar is called—into the rivet hole to hold it. When the ends of the girder are properly adjusted, a bolt is driven into each end until the riveters appear on the job.

Sure of Foot and Clear of Head

walk beams from 3½ to 6 inches wide and 30 feet long, like a tight rope walker. He must ride girders, pull guide lines, hitch loads along to balance them, and lower pulley blocks. Workmen swarm all over the dizzy tower. Away up so high that they look like dolls, painters perch on scaffolding; riveters and scrapers straddle beams; smiths heat rivets on tiny platforms and toss them up twenty feet into riveter's iron buckets. You can hear the ring of hammers, the hiss of steam, the crash of steel, the *brrr-rr-rr!* of the compressed air riveters, for all the world like so many giant woodpeckers. And you can see men scrambling up and down like acrobats, eating their lunches and smoking pipes in their airy arbors.

Many of these iron workers were sailors and used to climbing masts, but many began in machine shops, and are just such men as your village blacksmith. They are in danger all the time and they know it. A misstep, a sudden noise or silence, a gust of wind, a crack to catch the foot, an inch of ice and one may lose his footing. Some loose bit of iron is always falling. A shed is built over the sidewalk below to protect passersby, but the workman has no protection. A workman above him may upset a keg of rivets, or drop a bolt, plate or hammer. There is no moment when a shot may not fall from the sky.

Very few men can do this work, and it is not always the big, strong men who have the steadiest nerves. A coal heaver may turn sick as death and hurry down again; a pale

"Plenty of Ground in the Sky"

"There's plenty of ground in the sky!" said the architectural engineers who first proposed sky-scrapers. The phrase was so convincing and the business value of the idea has been so fully demonstrated that capital is readily secured for such building enterprises. But if you were either of these two men setting up the steel frame-work for the windows of an office building in New York City, you would think there was precious little ground in the sky, and that the nearest ground to your feet was dreadfully far away.

Like An Ancient Battering Ram

Here some bridge builders are working what may be called a "ready made" hammer for driving into place a part of the Blackwell's Island Bridge, New York City.

Just a Few Moments to Rest

No matter how tired you were it isn't likely you would choose such a perch on which to rest, is it? This man is waiting for the next piece of steel to be hoisted up.

Where the Iron Workers Come From

little printer or tailor go about jauntily. Many follow the trade for the big wages, are always afraid, but they have the grit to stick. It is like that story of Lord Nelson. As a thirteen-year-old "middy" in the British navy he was ordered up the main mast, which is like a rocking flagpole. Asked if he was afraid to go, he answered, with chattering teeth: "Ye-e-es Sir! But I'm going up!"

Greater than these lofty buildings and bridges, with their steel skeletons bolted together, is the spirit of the brave men who raise them to such dizzy heights. There are many dangerous tasks that men are afraid to do, but they "go up."

Lighthouses and Their Keepers

The Voice of the Siren

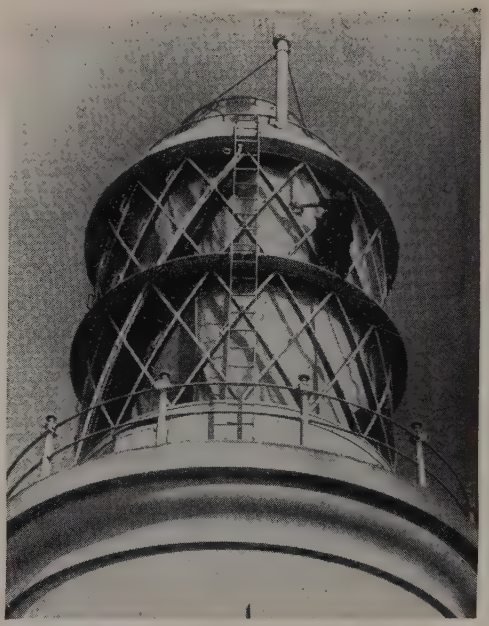
OF course, when there is such a fog that you can hardly see your hand before you, as frequently happens on the sea coast, the signal from a lighthouse or light ship would be of no use. At such times trumpets like those in our first picture call out to the ships to steer clear of the dangerous shores near which these signals are located. These fog signals are called "sirens." That seems a queer name, doesn't it, when we recall that in the myth stories, "sirens" were the cruel sea nymphs who lured mariners to the rocks by their beautiful singing. Ulysses, you remember, escaped them by filling the ears of his sailors with wax and having himself tied to the mast. While the sirens sang beautifully but acted very badly, the fog sirens are just the other way; they do a beautiful service but they make a queer noise. This is how Kipling describes it in "Many Inventions": "From the land the song resembles the bellowing of a brazen bull; but off shore they understand and the steamers grunt gratefully in answer."

Mr. Kipling is here describing the fog signal at the lighthouse

of St. Cecelia-Under-the-Cliff. It has the most powerful light on the south coast of England, and also a powerful fog signal, for it guards a very foggy coast.

The "breath" with which these sirens call out their kindly warning is often real breath, just like yours; that is to say, air which is compressed by engines in the plant. Other sirens, like that shown here, are operated by steam. Notice the siren's breath as it strikes the cold air. It condenses just as yours does on a frosty morning. The trumpets are curved down to prevent sand drifting into them. Other kinds of fog signals employed are whistles, reed trumpets, bells rung in the air and bells rung under the sea. These fog bells are very large affairs, some of them weighing 4,000 pounds. The hammers of the land bells are driven by a weight and clock work.

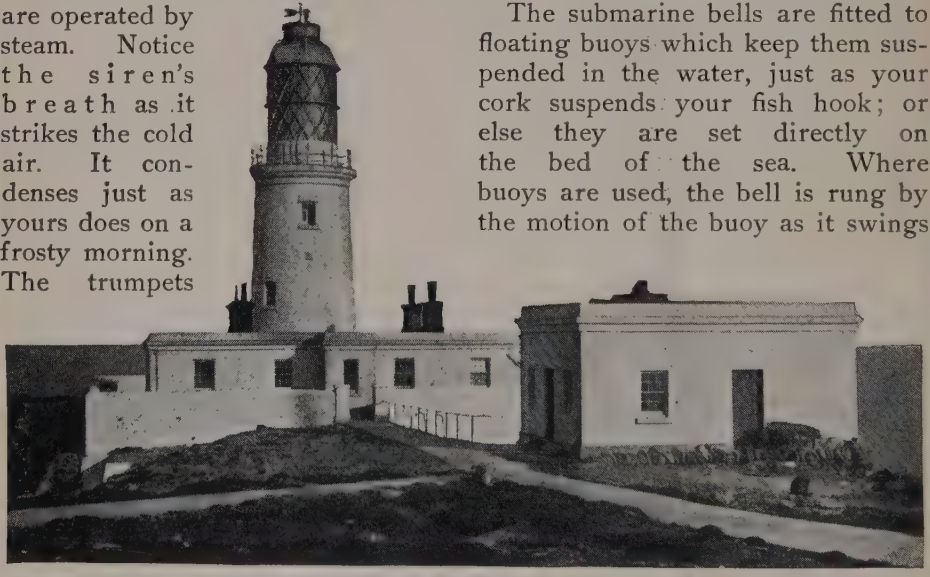
But When the Winds Are Bitter—!



Cleaning the lantern of a lighthouse on a pleasant day like this when you can work in your shirt sleeves is a light occupation compared to what it is in the winter time when the lights become coated with ice, as you will see.

Work of the Bell Buoys

The submarine bells are fitted to floating buoys which keep them suspended in the water, just as your cork suspends your fish hook; or else they are set directly on the bed of the sea. Where buoys are used, the bell is rung by the motion of the buoy as it swings



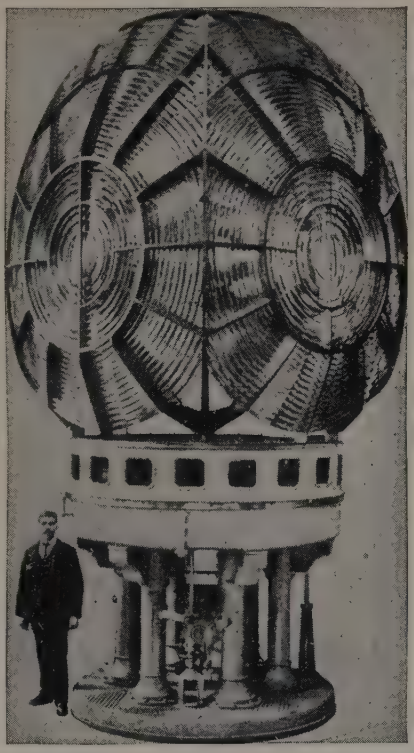
The Round Island Light Plant

This picture shows you the whole plant of the lighthouse where you have just seen the man cleaning the lantern. It is called the "Round Island Light" and stands on one of the Scilly Isles off the coast of England.

The Eye of the Lighthouse

back and forth with the waves. Those on the bottom of the sea are rung by electric current carried by a cable from the shore.

But only ships that have "ears" can hear these submarine signals; that is to say, the ships must have a kind of a telephone in them below the water line and connected with the metal plating of the hull. Through this plating the sound vibrates after it has been transmitted from the bell through the water. If you have ever held your head under water while some other boy at a distance knocked two stones together, you know how much better sound carries under water than in the air. These submarine bells can be heard at a distance of fifteen miles by properly equipped vessels.



Doesn't that look like the eye of some great insect, with its many facets? It's the lens of a great lighthouse light and inside of it is the light. While the great glass as a whole is called a "lens," those ridges on its surface are the lenses. They gather the light rays and concentrate them into a great beam of light which is thrown out upon the water. You will notice also that the whole affair rests on a kind of turntable. This is because the lens keeps revolving constantly so that the light is thrown out in a series of flashes. This is done so that it will not be confused with other lights on the shore. The machinery as it turns makes a rumbling noise that has been compared to the humming of a bluebottle fly under a glass tumbler. (Of course it would have to be a very big bluebottle fly and a very big tumbler.)

The Ancient Beacon Lights

The sirens and the bells are a modern invention, but ever since men began to go down to the sea in ships there have been lighthouses. Even before the building of the famous lighthouse at Alexandria on the Island of Pharos, which was one of the Seven Wonders of the World, there were light towers along the Lower Nile and it was part of the religious duty of the priests of Egypt to tend their beacon fires.

For centuries men did not devise anything to take the place of these beacon fires. As late as the seventeenth, yes, and the eighteenth century, grated braziers holding fires of coal and wood warned the sailors off dangerous rocks, or guided their way along the coasts of Europe and America. Beacon Island, near Boston, gets its name from a lighthouse built nearly three centuries ago, which was a beacon for sailors in times of peace, and a watch tower and signal station in times of war.

Uncle Sam's Great Lighthouse System

The need for lighthouses has grown, of course, with the spread of civilization and the growth of commerce. Their maintenance is one of the most important functions

To Save Her Sister Ships

This picture shows a light ship in a storm. You can see in what a dangerous place it is; for there is a shoal where the vessel is anchored by that chain. This vessel is lighted by electricity. In lighthouses electricity is not used on account of the expense, since lighthouses are in isolated places and would require an electric plant of their own, which would be too expensive for the amount of light required. But where the water is too deep, or there are other reasons why a lighthouse cannot be erected, light vessels are used. They also have the advantage that they can be moored in different places as needed.

of government, and their construction and equipment one of the most interesting and important features of modern engineering. The United States has lighthouses along 48,000 miles of its coasts that front the sea, 4,000 miles of the shores of the Great Lakes, and 5,000 miles of rivers. This, you will see, if you stop to figure it, is twice the circumference of the earth. It is the most extensive lighthouse service in the world.

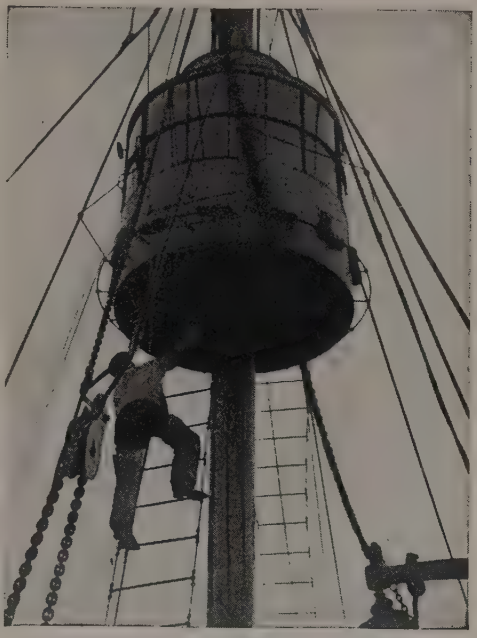
Lighthouses are broadly divided into two classes: those on land, where waves cannot reach them; and those on lonely little islands, on isolated rocks and shoals and other situations exposed to the blows of the waves. These lighthouses that breast the sea are called "wave-swept towers," and their construction calls for as much fine courage as does the life of the sailors which these wave-swept towers are intended to protect.

The Building of a Lighthouse

If you should watch from an adjoining shore cliff the first steps in the building of a lighthouse on some dangerous rock off the coast, you would first see a few men—often not more than two or three, because there is no more room on the rock—scraping off the seaweed. (Seaweed will grow, even on these storm-beaten rocks. It cares nothing for the blows of waves, provided they don't throw stones.) The men do not scrape off all the seaweed, for while they are drilling the rock for a foun-

dation, the wind is apt to rise and tremendous waves dash over them. Then they throw themselves flat, grip the seaweed, hold their breaths until the wave has passed and get up and go to work again. This is only what these brave men would call "ordinary weather." On some coasts the weather is so wild that men can work at all only at long intervals. On one lighthouse, work was only possible for 30 hours in a whole year. Such lighthouses, you may imagine, go up very slowly.

Lighting the Light on a Light Ship



Not all light ships are lighted by electricity. Here is one that uses oil so that it is necessary for a man to light it every night as you do the oil lamp at home.

The Life of the Brave Keepers

At all important stations there are from two to five keepers. At lighthouses on routes of less traffic there may be only one keeper, and sometimes one keeper to several lights. The pay is not

The Light Ship at "Seven Stones"

Here is a light ship which is located off the coast of England at a point known as "The Seven Stones," from seven dangerous rocks in the vicinity.

A Lighthouse in the Thames

The Thames, which is the great waterway to London, is the busiest river in the world, and this is one of the lighthouses that guide ships into port.
On the right is a lighthouse keeper on the Scilly Isles, operating a semaphore signal in conversation with an approaching vessel.

large and you don't have any company but the sea gulls and the winds, and the chant and thunder of the waves. At the most distant light, on the coast of Alaska, for instance (it looks dreadfully

A Gas-Lighted Buoy in the Thames

This is another one of the devices for the guidance of ships up and down the Thames—a buoy lighted by gas.

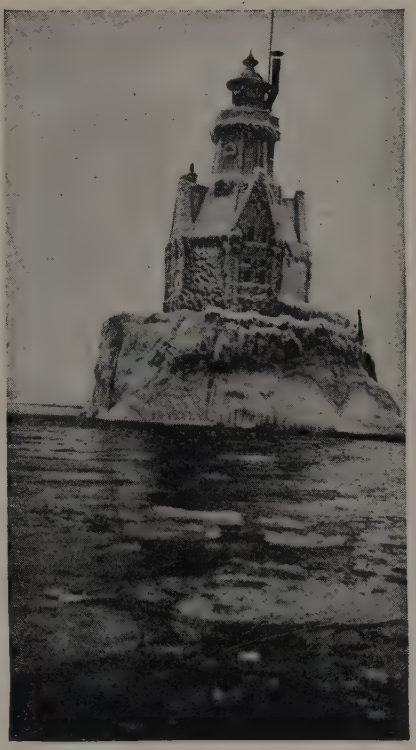
lonesome even on the map!) it is sometimes five months between mails and the nearest neighbor is a trapper ten miles away. The records at Washington show that the keeper of the lighthouse near the mouth of the Columbia River has been absent only two days in twenty-three years, and one of these absences was for the purpose of getting himself a wife. Don't you think she was a brave woman?

Yes, and there are women lighthouse keepers, too; and like the faithful men who guard these dangerous and lonesome coasts, they take great risks and endure great hardships to do their duty. One of these women is the keeper of the Angel Island lighthouse on San Francisco Bay. There is also a fog signal at this lighthouse and once when the machinery that sounds the warning bell was out of order, she struck it by hand for 20 hours, standing all night on the platform outside until the fog lifted.

In her brief official report of it to the government—it was only four words long—she said, "the fog was dense."

That was all!

This is What Happens in Winter



How would you like to keep that lantern clean, as the man is doing in our second picture? This is the Racine Reef Lighthouse in Lake Michigan. In winter the spray and sleet freezes on the lantern so that it shuts out the light almost entirely and the man in the lighthouse must see that it is kept clear.

Divers Gathering Pearls

In our story about pearls you can see one kind of a pearl diver at work. His only equipment is a basket, nose clamp, and a stone to make him sink. Here are divers in regulation diving dress gathering pearl oysters. One of them is putting the oysters into a basket let down by a rope from the ship above; the other is being hauled up to the surface. See how he is kicking. That is to quicken his circulation, which the pressure of the water and the cold have retarded.

The Man Who Works Under Water

"Like the pilot and the fireman, he takes fearful risks as a matter of duty."

DID you ever hear the story of the brave little Dutch boy who saved a great valley, with towns and farms, from being destroyed by flood? He found water trickling through a small hole in the dyke that walled out the sea. It was nightfall and no help was near. So he pushed his arm in the hole and held it there all night, keeping the break from getting larger. Such a boy, to-day, would get a Carnegie medal, be educated from the hero fund, and become famous.

There is another story much like that, but few people have ever heard it. The hero was a diver, and what he did was simply his duty—just a part of his everyday work. There was a break in a great dam of a reservoir, far below the water line. On the lower side, the water spouted out in a big stream. One diver was sent down to fix a steel

plate over the break so the hole could be filled from the lower face. But in a moment he pulled frantically on the life line and was hauled up. He said any man who went down would be sucked into the hole.

goggle eyes screened with wire was screwed to his collar. Air was pumped in, swelling his suit out like a balloon and roaring in his ears like a railroad train. Before he could signal, air and life lines

Getting Into His Working Clothes

A diver's suit is so clumsy and heavy that he can neither put it on nor take it off alone. He has to be "buttoned up" like two-year-old baby brother.

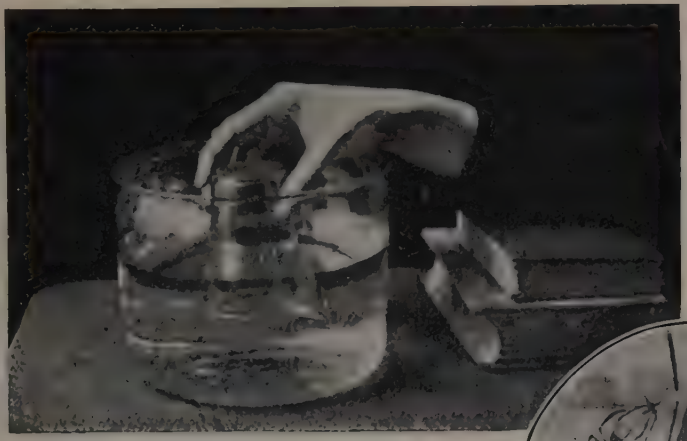
The Brave Captain and His Fate

The captain of the wrecking boat said, no matter, the work must be done. He would go down. He put on the diver's rubber suit that is in one piece to the chin and wrists. He put on a copper collar, iron shoes that weighed thirty pounds, and a hundred-pound lead belt with life lines. After he stepped onto the ladder, a copper helmet with big goggle eyes screened with wire was screwed to his collar. Air was pumped in, swelling his suit out like a balloon and roaring in his ears like a railroad train. Before he could signal, air and life lines snapped. His body stopped the leak. It could never be got out. There he was, walled in.

Strange Suit That the Divers Wear

Much necessary work must be done under water by divers, in the deep sea and in rivers, harbors, and reservoirs. Sometimes ships are wrecked where they are as dangerous as rocks to other ships. If they cannot be pumped out and raised, they must be broken up with dynamite. From wrecking boats that

Three Kinds of Diving Bells



Force an inverted, empty tumbler down into a pail of water and you have a diving bell—air under water, held in place by the sides of the tumbler and the pressure of the water below it. The air keeps the water from rising beyond a certain point.

The picture below shows fresh water spiders at work on their home which is another kind of a diving bell. The spiders spin a bell-shaped cocoon attached to some plant growing on the bottom of a lake or pond. Then they fill their home with air by carrying down a bubble of it at a time, using the plant as a stairway. When the home is full of air, held in place just as that in the tumbler is, they set up housekeeping and raise a family in their snug little home under the water.

Here is the diving bell which men have built. It is simply a bell-shaped, metal-covered house which is lowered evenly into the water. The metal makes it heavy enough to sink. When it reaches the bottom, the men can work and breathe in it. You see it is fitted out with a telephone and electric lights. It has an arrangement for keeping the air fresh, too. The men are placing one of the foundation stones for a big bridge. If they wish to move over to another part of the river bottom, they will sit on the little seats attached to the sides of the bell and then men, air, bell, stone and all will be swung the proper distance through the water by machinery above.

are just mud scows with steam pumps and hoisting tackle, and a machine shop full of tools, the divers go down into the water on ladders.

Various Work the Divers Do

They do every sort of work under water, just by feeling, for they can see little or nothing. They go all over sunken ships; get papers, money and jewels out of captains' safes. They put in pipes for pumping; patch holes with iron plates, or cement; nail down hatches; fasten cables so a wreck can be dragged from a bar; and plant dynamite to blow up hulls. They cannot stay down more than half an hour and must work very fast.

An Exhausted Diver

This man stayed down as long as he could. He could barely climb up the ladder. Here you see him having the heavy helmet taken off before he is helped over the rail, so that he can get a breath of good, fresh air as soon as possible.

Something different happens every time. Divers for pearl oysters in tropic shore waters are chased by sharks. All the weapons they have are the air bubbles they can let out in a rapid fire of silver bullets from the wrist bands, but those scare the man eaters away. Ship timbers often break loose from a wreck and stun the diver. Sand slides carry them down. A leak or break or tangle in the hose cuts off the air. If the life line is caught, the diver cannot signal. A diver cannot lift himself, but has to be pulled up. He wears a small telephone system by which he can talk with the man above. For the air he breathes he must depend on the man at the pump above, and on a small rubber tube. Like the pilot and the fireman, his duties involve fearful risks.

Life Savers and the Beach Patrol

The Breeches Buoy

When a line is shot to a ship in distress the first thing to go over it is a packet of instructions telling how to make the rope fast to the mast or some other suitable part of the wreck. Then the breeches buoy is unloosed and begins the work of carrying people ashore in safety. It is a cork life-buoy with canvas breeches attached to it and usually carries only one person at a time. The picture shows how it works.

Lighthouses and Life-Savers

IF YOU have ever been to a seaside or Great Lakes resort, you may have seen a tall lighthouse, on a green lawn, out on the farthest point of land. At its foot is the keeper's neat dwelling, and nearby the comfortable quarters and boat house of the Life Saving Station. Along the most dangerous parts of the Atlantic coast there is a government station every five miles. They are farther apart on the Gulf coast, and fewer still on the less dangerous Pacific coast. On the Lakes nearly half of the stations are on the populous shores of stormy Lake Michigan.

In the winter, almost surrounded by dreary wastes of water, the life is lonely. But the life-saver

A Life-Boat and Its Crew

© *Underwood & Underwood*

Modern life-boats are self-righting; that is, they are constructed with air-chambers and are ballasted so that if tipped over, even with their crews in them, they will quickly turn right side up again. Valves automatically bail out the boat. The life-boat in the picture is a rowboat. There are also gasoline and steam life-boats for the coasts where they can be used. Notice the clothing of the men—cork jackets, rubber gloves and mittens.

is a soldier. Every hour has its hard duty. The crew are drilled daily in handling the heavy beach-wagon; in running the life-boat off its rollers into smooth and rough water; in swimming in cork jackets; in signaling with the Coston light; in firing the life line; building bonfires on the beach; pulling in the breeches buoy and the life-car over the cable, and in restoring the half-drowned and frozen. And then, as policemen patrol the city streets, so life-savers patrol the beaches, day and night, in six-hour watches.

Kept Constantly in Training

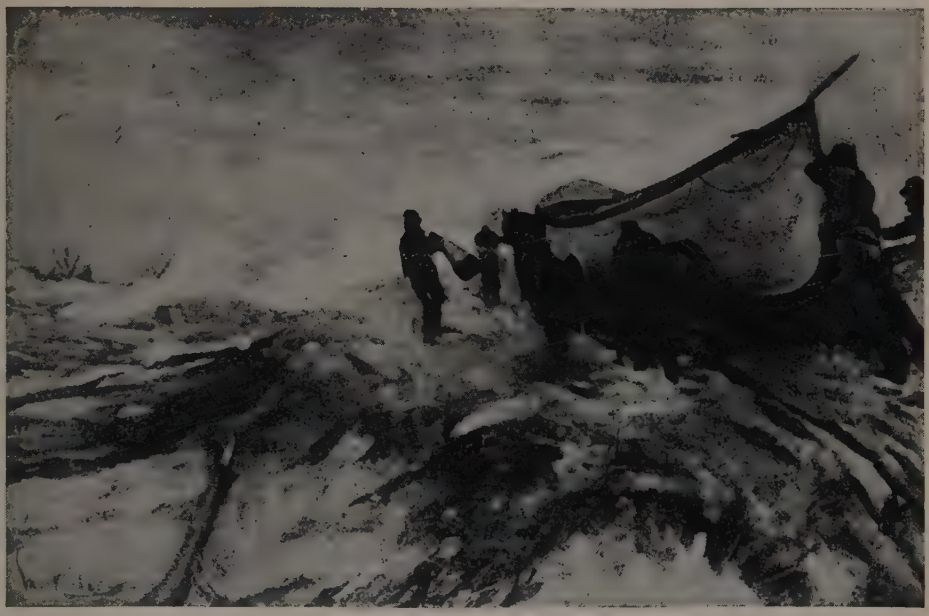
The night march is the hardest. At sunset two men leave each station, and walk in opposite directions, half way to the next station. In wind and rain, snow and sleet, bitter cold and flooding tide, thundering combers and heavy sand they walk, with only a lantern or a dog for company. The first man to see a vessel in distress burns a Coston light. This is a torch that, on being struck, leaps into scarlet flame. It can be seen for miles. From man to man the signal is passed, as fast as a telegraph message. Every station on the coast to windward keeps a lookout. When the ship grounds on a bar, it may not be seen for fog or storm, but it blows a fog horn and sends up rockets.

Night March on Stormy Coasts

They're Off to the Rescue!

"All hands!" bellows the captain of the station nearest the wreck. It is like the striking of the fire gong in an engine house. Men jump into cork jackets and oilskins, grab their lanterns, run out the beach wagon on its broad trucks, and the life boat. They slip into the rope harness and run. On the beach wagon are the ropes and buoys, shovels, picks, sand anchors, shot-line box and cannon,

Life Savers at Work



Launching the Life-Boat

Because of the dashing of the waves and the roaring of the wind, the captain gives his commands through a megaphone. Launching the life-boat and handling it after it is launched, besides being dangerous work, must be done quickly. All the men work together like a well-trained team of football players. At such times each man knows what his share of the work is and does it quickly and well, because he is drilled at this work like a soldier, every day he is in the service. In the lower picture the two life-boats are trying to get alongside the injured vessel, whose shadow can be seen at the left.

© *Illustrations Bureau*

Rescue Work in a Choppy Sea

Another Kind of "Trolley Car"

© *Illustrations Bureau*

The picture shows a man being brought ashore by an apparatus similar to the breeches buoy in operation, from the steamer Gradac, which was grounded off the coast of Northumberland, England.

"All Hands Saved"

Everyone on board has been rescued and the ship is sinking rapidly. Two weary life-savers are hauling in an empty buoy.

When the Breakers Are Too High

© Illustrations Bureau

On steep, rocky coasts it is hard and dangerous for a boat to land. In the picture the difficulty is being overcome by a crane on the landing stage of a lighthouse. Instead of taking each boat-load of passengers through the pounding breakers in which their boat is liable to go to pieces, the life-savers are coming as close as possible to the lighthouse and hoisting them on to it with the crane.

When There is a Sandy Beach

Where the water is shallow and the beach sandy, the people rescued can be landed on shore at once, for, though the waves may be high, they are not so dangerous as on rocky coasts.

and material for a bonfire if one can be kept burning. If the sea is high the first thing tried is to tie a cord about the shank of a bullet and shoot it to the wreck. But if several shots miss the deck, or the survivors are helpless, the life boat must be launched. It may be beaten back, overturned or spun about. If it can be got beyond the half-mile wall of surf, a strong swimmer may drop overboard and carry a line to the wreck. He battles with smashing waves and climbs by the anchor cables, perhaps to a deck as steep as a roof, whose rails have been swept away.

Thinking Only of the Lives of Others

He drags half frozen people from the rigging, pulls in his line, rope and cable. "Women and children first" he puts into the breeches buoy, or closed life car, and starts over that sagging "trolley" line. The captain comes out to help him. Not until the last passenger, sailor and rough coal heaver are safe on land does the life-saver come ashore. And then it is often with a shivering dog or kitten in his arms.

"Women and Children First"

Then it is thawing and drying by the bonfire, wrapping in oilskins and running up to the station, and hot coffee, blankets and beds for the rescued. But for the life-savers—they have merely done their duty. Some of them can turn in to rest, but two, at least, get into dry clothing and go out again to patrol the beach.

Wonderful Pictured Knowledge People of Long Ago

THIS is a scene on Lesbos, one of the islands in the blue Aegean Sea, before the days of books. Sappho, the beautiful Greek poetess, who wrote such wonderful verses that she was known as the Tenth Muse, lived on the island of Lesbos, where she was the head of a school of women poets. Tired of singing and dancing to the accompaniment of the lyre and the tambourine, Sappho and her friends have all collected on these marble benches overlooking the blue sea, and a young Greek is reading passages from Homer with the poem spread out before him on a scroll. The scrolls were the only kind of "books" the Greeks had, and they had very few of these. But they had extraordinary memories. Even boys at school could recite the whole of the Iliad and the Odyssey.

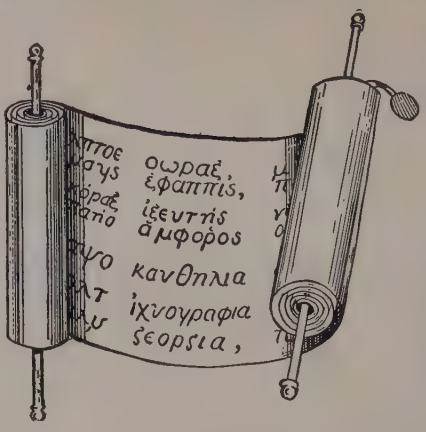
These scrolls were made of the fine pith of the Egyptian papyrus. The strips were glued together in one long sheet, which the reader gradually unrolled with one hand and rolled up with the other as he read.

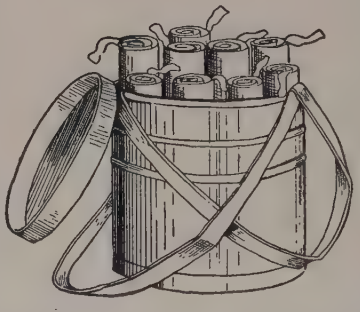
The Greeks were the most brilliant people who ever lived. Everybody knows their sculpture. But they were equally great in poetry, science, philosophy, oratory—in almost everything that makes life beautiful and interesting. No people ever produced so large a portion of great men out of so small a population. Just think of it—Athens, the most brilliant of all the Greek cities, had only about 30,000 citizens.

And do you know why the Greeks did all these things? Because among other things they were, more than any other nation in history, what we may call "pictured knowledge" people. They not only reproduced and created beautiful forms in their statues, their temples, their vases, but they thought in pictures, talked in pictures, wrote in pictures. Almost every word in their language was a picture and carried its meaning on its face. The Greek word for cow, for instance, meant "foot dragger." Did you ever notice the peculiar way in which a cow drags her feet in walking? Not only was it easy for Greek children to remember such picture words, but the use of such words made them very observing. You know how hard it is to remember the meaning of new words, and how easy it is to remember a picture. So, because their language taught the little Greeks to observe

whether a cow does drag her feet, for example; and the things learned in Greek words were so easy to remember, they learned them very fast. Do you know why you can dream such long dreams in such a short time — dreams that would make five reels of a movie show, but really only last a few moments when you are dreaming? It is because a dream is a succession of pictures of whatever you are dreaming about.

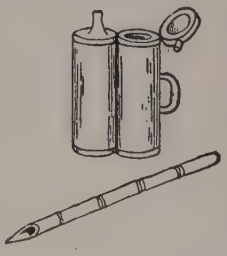
Because of this habit of seeing everything very clearly, the Greeks were like eager, curious children —grown up people and all —and they learned about the world and its wonders and its mysteries, and told about them and what they thought about them in sculpture, temples, philosophy and oratory, in poetry and song.



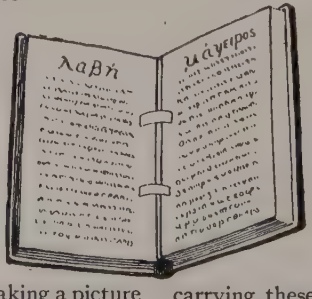


The Riddle of the Reed

Just to show you what children even the grown-up Greeks were—how do you suppose they amused themselves, say at an evening party? By asking riddles, for one thing. Here is a Greek riddle: "I was a reed, a useless plant at first; for from me grew neither apples nor figs, nor the clustered grape. But a man gave me thin lips, and made me the channel for a narrow stream. From that time, when I drink black ink, I, like one inspired, speak winged words with a voiceless mouth."



Can you guess it? There is a drawing of it right under your eye. It is the reed pen. But isn't the word-picture in the riddle just as perfect as the picture in the drawing? Every little thing is put into the word-picture—the reed, its long narrow channel full of ink, the thin lips, and how it drinks when you dip it. But this Greek riddle-maker was not content with making a picture of the pen alone. He adds the picture of a man speaking and of words flying through the air with wings, and the shape of the grape (clustered). Words like these are really pictures. Can't you see them?



Why the Greeks Did Not Like Learning Their A B C's

The Greeks thought it so much more important to tell things in pictures than in mere printed words, that for centuries they did not use the letters of their alphabet for writing stories or poems at all. They only used them for recording contracts and other business transactions. They said the written word did not look like the thing it stood for, and when they finally did begin writing their wonderful books, you see they still used these words to make pictures.

Why Pictures Should Be Taught to Talk

The Greeks not only had the fondness of children for pictures, but they were like children in another respect. They did love to talk. That is why the great Greek philosopher, Plato, said you learn so much more by having people tell you about things and answer your questions than if you merely read about these things, or even looked at pictures of them. "The people in paintings," said he, "look as if they were alive, but you ask them a question and they preserve a solemn silence." So you see why in Pictured Knowledge we have made the pictures talk.

The Pictures on This Page

The pictures on this page are interesting chapters in the history of books. At the top is a Greek scroll, with a little label on a slip hanging out of it to show when the scroll was all rolled up what it was about. The next picture shows a case for carrying these scrolls. Next is a reed pen and an ink stand, and below is a book made of separate leaves. It looks much like the books we have today, doesn't it?

How Pictured Knowledge Learned to Talk

The Scribes

It was another long time after books with "lids" were invented before men stopped making them with the pen—just as you make those delightful illustrated books of your own about geography, history, and things in school. The most beautiful work of this kind was done in the monasteries. You see one of the monks with a folio volume on which he is working like an artist at his easel. He is sitting where he can get a good light. He is, no doubt, designing and coloring an illuminated letter at the beginning of a chapter in the book. As early as the Thirteenth century, in spite of this slow way of making books, there was quite a book trade. No university or monastery was complete without its staff of scribes who wrote the main body of the work, and illuminators who put in decorations in the initials and on the borders of the page. No book was popular unless it was ornamented and illuminated in this way.

WELL, I thought I never *would* get here!

Who am I?

This book you are reading. I am just full of stories of other things; I tell other people's stories, so isn't it fair to let me tell my own story? Such exciting adventures as I had with men and machines. To get the paper I was printed on—now what is that wasp doing in here? It isn't *his* story.

"Buzz-zip! Speaking of paper," says the wasp, "I thought I would tell you that I was the first paper-maker in the world. Human people think themselves very bright. But really they are slow about some things. Ages before men made paper we wasps used bits of wood, chewed them to a pulp, and then spread the pulps out thin to dry. We have always made our little gray nests that way. Good-by."

Where the Old Rags Go

Mr. Wasp is right. But to make paper, you could print on, or write

In the Library

The books of the Middle Ages were mostly on law or religion. Here we see a high dignitary of the church sitting in his chair while his assistants are looking up authorities for him and they are talking matters over. You see they still had important manuscript in the shape of rolls, although new works were bound in covers. On the right you see a large volume resting on a stand similar to those on which our big books, like dictionaries, are sometimes kept today.

on, we would have to bleach the nest of an ordinary wasp and iron it smooth. There is a wasp that makes a nest so smooth and white you can write on it. Fine book papers, such as I am printed on, are made of rags and wood pulp mixed. Whole spruce trees, with the bark stripped off, are ground to a mush in a machine and mixed with pulp of cotton rags. The pulp is boiled with lime and soda to clean it. Then it is bleached with acids, and thinned with water until it looks like milk—but thinner.

Then this milk flows out of a tank onto a wide copper wire screen belt. On the belt it drains and is shaken gently together until it becomes a thin wet sheet, like a wet sheet of blotting paper. As it leaves the belt it passes between rollers that look like big clothes-wringers. But these rollers are hot. They dry the pulp, iron it smooth, trim and wind it—miles of it. Paper for newspapers is wound on big iron spools ready to be fed into the newspaper printing presses. But the kind of paper you are looking at is cut into large sheets and packed in bales. The smooth paper on which my colored pictures are printed—remember who is talking—was starched with glue and white clay. Then it was steamed, ironed and polished until it was as glossy as father's collars, when they come home from the steam laundry.

How the Printer Says His A B C's

Making the type from which I am printed is another story. Has your father a rubber stamp? The rubber

The Press

This is one of the famous pictures you will see on the walls if you ever visit the Congressional Library in Washington. It was painted by an eminent American artist, John Alexander, and is called "The Press." It shows a noble of the Middle Ages examining with great interest, a sheet which has just been printed on the screw press, which the man is working on the right. Presses were great novelties in those days, and you can imagine how their work must have interested a man of fine culture like this nobleman.

letters on it were molded. The type in printing offices was cast in molds. The letters on the ends of the bars in a typewriter were cast, too. When father was a little boy all types were cast by pouring melted type-metal into molds. Type was kept in the printer's "case," each letter in a different nest. The printer picked up one type at a time, and set it in a box, or "stick," to spell words. That was slow work. It was the typewriter that hinted at a new way of setting type. When the key of a typewriter is struck, a bar flies up, hits the paper and prints a letter. To print on a typewriter is like playing on a piano.

"Why don't you *make* your type as you need it, Mr. Printer Man?" the typewriter seemed to say.

So men, taking this hint, built typesetting machines of two kinds. One kind is called the monotype machine, the other the linotype machine. When an operator of a monotype, or one-type-at-a-time machine, strikes a key, a hole is punched in a long paper ribbon. This ribbon is wound on a spool, something like the music roll of a piano player. In the piano player, as the roll unwinds, a tune is played. So when the monotype roll is put into the casting machine and unwound, words are spelled in hot type-metal.

Spelling With Hot Lead

Inside the machine is a frame filled with little blocks of wood, with letter molds cut in the top. That frame darts around like an excited water bug. Each letter that was struck on the keyboard comes, in turn, under a pot of type metal that is kept melted by a gas jet. A drop of molten metal spurts out and fills the mold. It works in the queerest way. It's like playing a flute! The perforated paper ribbon is made to run over a tube with holes in it, just as you slip your fingers over holes in a flute. The tube is filled with

The Press that Franklin Worked

compressed air. When a hole in the ribbon comes over a hole in the tube, the air is blown through and into a pipe. The pipe is a sort of popgun with a pin plug in it. The pin jumps out and pushes that frame of letter molds about, so the right letter comes up to the melting pot to be filled. You would think the monotype machine had brains.

A "Line-o'-type"

The linotype casts a whole line of words in one solid bar. The type molds, or matrices, are in the edges of flat pieces of brass. The operator of a linotype plays on a keyboard, too. Watch him make that machine spell something for you. When he strikes a key a brass letter mold rushes down a narrow alley like a boy on a toboggan slide. "Rat-tat-tat, clickety-click - click!" a crowd of molds slide down, are carried across a belt, and lined up like a row of tin soldiers. Then the machine moves the whole row over to the melting pot. A plunger forces the metal up through a tube like the stem of a tobacco pipe and fills the matrices. In a moment the metal hardens into a line-o'-type. You have to read it backwards, like Hebrew.

"Hello, John! I can beat you at spelling and punctuation," it reads.

Can it? Can it beat you? But just watch the little brass molds go home again. Each one is a latch key to unlock its own door. You know a Yale door key has notches that just fit the lock.

While you are in Washington you are sure to want to go through the museum of the great Smithsonian Institution. There you will see what is known as Franklin's printing press, the one he used when he was a journeyman printer in London. It is kept in this glass case because, unless it were protected, visitors—particularly inquiring boys—would be sure to take hold of that handle and give it a turn just to see how it worked. You laid your sheet of paper for printing on the flat bed of type, just as you see it in the small country presses today. Then you turned a crank (not shown here) like the crank of a windlass. This carried the bed with its type on a cog track under a metal plate called the platen. The screw you see in the picture fitted into the center of the platen in a kind of ball and socket joint. Then you gave the handle a turn, and that screwed the platen down firmly on the paper and pressed it against the type. The action in a screw press was like that of a screw when you turn the screw-driver, only the "screw-driver" in the press stood at right angles to the screw. In printing a newspaper on this press you could only print a page at a time.

Caxton, the King, and the Printing Press

Imagine a king and his court today visiting a little print shop like this. Nearly every boy wants a little printing press of his own, and sometimes gets his first introduction to the wonders of machinery in the work of the press that prints the newspaper in his town. But even kings could enjoy the wonders of the printing press in the days to which this picture takes us back, for at that time the printing press was a new thing and a wonder-working device. If you wanted to own a book printed on this press, it would cost you more than all the beautiful school books you have had, or will have even if you go clear through the university, for Caxton, who is standing behind the press showing it to the king, was the first English printer. The books that he printed command very high prices, partly because they are very beautifully done, and partly because of their historic interest and their rarity. One of them was sold in London some years ago for over $10,000.00.

The king, Edward IV was at this time a handsome man in the prime of life, as you see by the picture. The lady on his right is the queen, Elizabeth Woodville, whom he married secretly, against the wishes of Warwick, "the kingmaker." Although Edward was king of England, he had very gracious manners toward his people. The three children with King Edward and Queen Elizabeth are Elizabeth, Richard, and Edward. The little girl afterwards became a queen like her mother, as the wife of Henry VII. Look up the story of little Edward the Fifth, and read about these three royal children.

The king, his family, and the court are looking at the freshly printed page which the little printer's boy is holding before them. The little group of men around the table at the left comprise the bindery of this printing establishment. Notice the strings suspended from the horizontal bar; they are for fastening the pages together. On the floor there are glue pots, loose leaves to be bound, and books all ready bound. At the right two men are at work setting type by hand. Near them is a basket that looks like a waste basket. It holds the manuscript that is going to be printed next. The beautiful pillar and arches in the background look rather queer in a printing office, don't they? But this one was set up in one of the rooms of the king's palace at Westminster.

Well, the little brass molds have notches, each one different from the other. And these notches have teeth. With these teeth they cling to a "distributor" bar to be carried up that toboggan slide. Channels and stalls open along the way, and the molds try every one, but they have to go on until each finds its *own* door. They act just like little pigs, these little molds, poking their noses into every hole, until they find one that they fit. Then in they go!

To make a book is like the seven labors of Hercules. When one hard thing is done there is another waiting. In big printing offices, printing is not done from the types, but from copper plates called electrotypes.

A type page is laid on an iron table, warmed by steam and brushed over with the same kind of smooth black powder that you get in sharpening a lead pencil. It is called graphite. This is to keep a thin sheet of wax, that is laid on the type, from sticking. Press a penny into a piece of soft gum and make a picture of it. In the same way a wax impression is made of the type page. Then the wax is lifted carefully, dusted on the face again with the graphite powder and hung in a bath of water, in which copper and sulphuric acid are dissolved. After it is dissolved, of course, you cannot see the copper at all. You know you can't see the sugar or salt that is melted in water. Now, when the current of electricity is turned into the bath, the copper just flies to the graphite powder on the wax. The copper forms a thin shell with the shape of the type on it, like the shape of the penny in gum. This is called electrotyping. Then the wax is melted out of the shell. The back of this copper plate is filled with lead to make it solid, and the plate is nailed to a wood block.

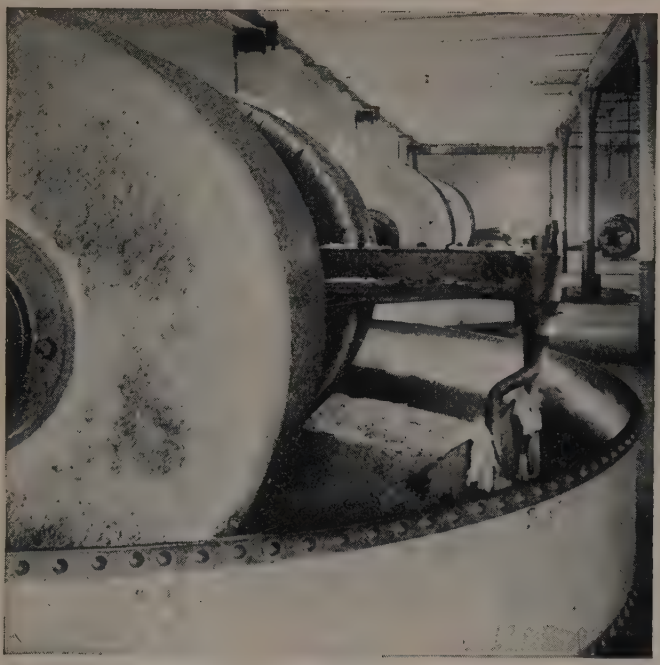
The Wasp Who Told Us How to Make Paper From Wood

Of course all of us have heard that the wasps were the first paper-makers, but did you know that it was a wasp who told the first paper-makers how to make paper from wood? And it was a particular wasp who did it. She was born in the Harz Mountains in 1839. One day in the fall a German paper-maker named Gottfried Keller, returning from his mill, stepped on an empty nest which this wasp had made and kept house in with her brood during the summer, and which the autumn winds had blown down. He crumpled it in his fingers, and decided it was wood pulp and wondered how the wasp did it. With a friend he experimented, decided that the wasp had made her paper house out of spruce, tried it on a grindstone, using water to mix the pulp, as the lady wasp had used saliva, and so discovered the secret. The thousands upon thousands of newspapers that are turned out from the presses all over the world every day, are all made from wood pulp paper—all because of the hint of this little lady wasp of the mountains.

Our picture here shows a very high quality of white paper made by a Brazilian wasp. The surface is so fine and smooth that you could write on it with a fine pen.

How I Had My Pictures Taken

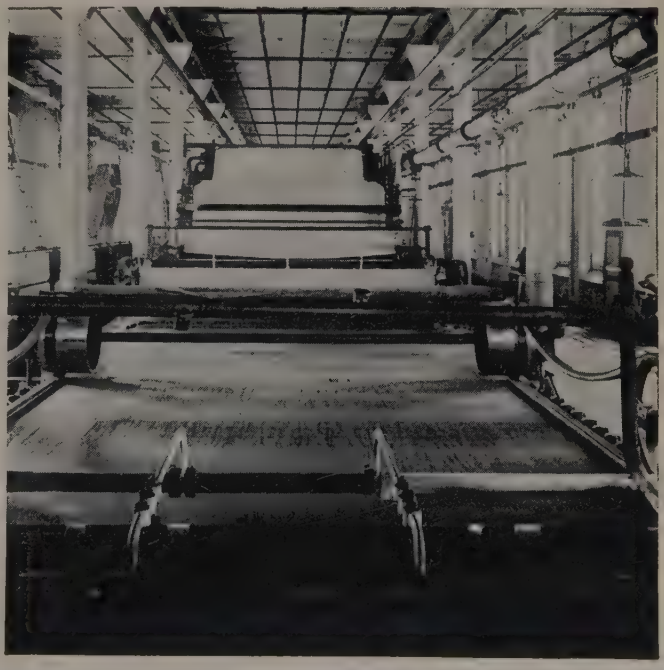
No, I cannot be printed yet. My pictures have to be made. A book without pictures is like an egg without salt. I have three kinds of pictures, each kind printed from plates



Like Gottfried Keller's Old Grindstone

Here you see how the great paper mills have taken the hint from the wasp and Gottfried Keller's old grindstone. The huge grindstones here are called crushers because they crush the pulp after it has come from the grinding machines. This is done so there will be no lumps or strings left in it.

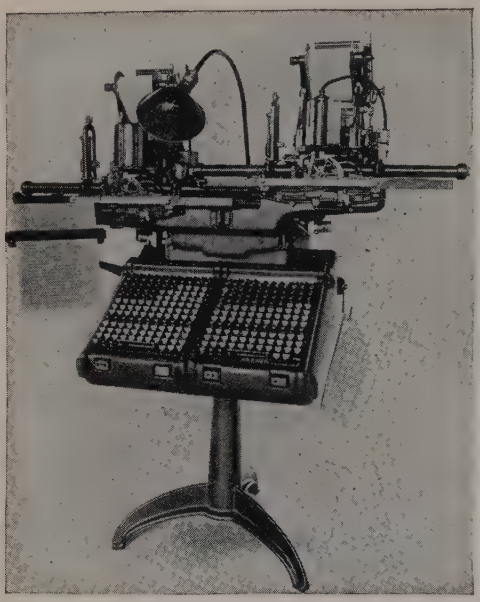
These engravings are reproductions in line or screen effect from drawings, paintings, photographs or objects. If you have a kodak you know that the photographs you make are from exposures, through the lens, on a film which unwinds from a spool on the inside of your camera. This film is highly made by the photo-engraving process, and known as zinc etchings or line engravings, black and white or half-tone engravings, and half-tone color engravings.

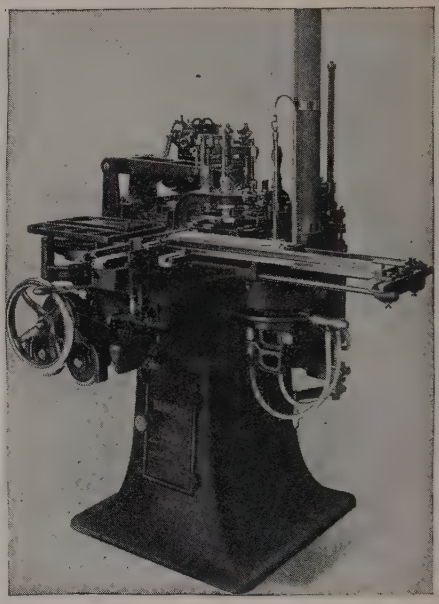


Where the Pulp Is Changed to Paper

Here is where the pulp is changed to paper. Before you, you see running an endless belt of fine mesh wire cloth on which the pulp is spread out. Those rubber belts on the right and left move with the pulp and keep it in place. As the stream flows along, the water filters through the wire mesh, leaving the fiber on the surface, and the shaking motion of the wire cloth helps to knit the fibers together. In the distance where you see the white paper mounting toward the skylight, the sheet of pulp has passed under a cylinder called the "dandy roll." Then it goes between the first press rolls, then through the second press rolls, then to the drying cylinders, and on through the calenders, or finishing rolls.

The One-Type-at-a-Time Machine





Here are two pictures of the Monotype machine. The one on the left shows you the keyboard on which the operator spells out the words just as the typewriter operator does on her machine. Above, and to the right, you see the paper ribbon in which the holes are punched. When the roll is put into the casting machine (on the right), it causes the machine to cast these letters in metal, and set them up in rows so as to spell the words which the operator has written.

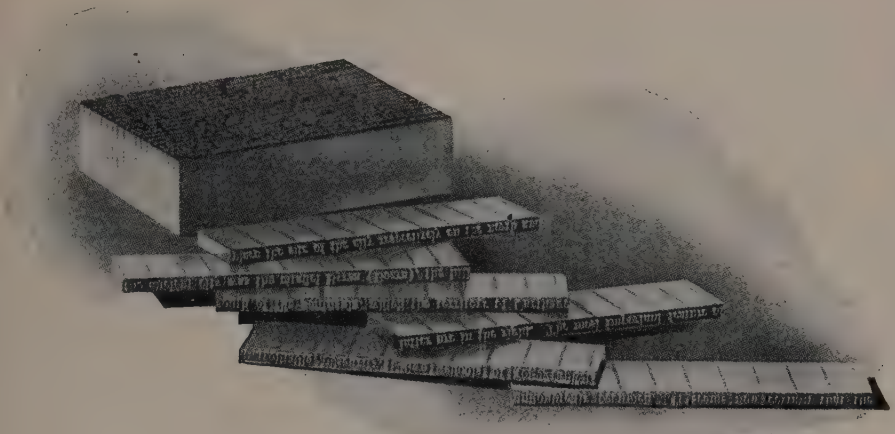
sensitive to the action of light, and when the exposure is made the image is transferred to that film. When the film is developed you have what is known as a negative. From this negative you make prints on sensitized paper. The result is a photograph of the object or scene.

Suppose you had a pretty drawing in school that a newspaper wanted to reproduce. The engraver would photograph it much in the same manner as you had photographed your little sister with your kodak, only his camera would be larger and it would contain a sensitized glass plate instead of a roll of film. The negative would be printed on a sensitized piece of thin zinc. This print would be ink-resisting on its entire surface, with the exception of the lines corresponding to the drawing from which the negative had been made, so that in the next operation, when the engraver runs an ink roller over the plate, the ink takes only on those lines and leaves the rest of the plate perfectly clean.

The Use of "Dragon's Blood"

The plate is then warmed slightly and dusted over with "dragon's blood," a resinous red powder. The plate is then heated until the powder is thoroughly burnt in on the lines of the drawing. Then it is placed in a solution of nitric acid and water. The dragon's blood protects the lines of the drawing from the action of the acid, which etches or eats away the zinc between the lines. The plate is left in the acid for only a short time, for the acid must not be allowed to eat away the zinc under the lines of the drawing, or else they will break away, and the plate will be useless for printing purposes.

The Linotype



This picture shows you where the linotype casting machine gets its name. You see each line of type is in one solid bar.

The plate is usually placed in the acid three times before an etching of the proper depth is secured. Each time it is taken out of the acid the plate is dried, then heated, and brushed with dragon's blood, and then burnt in hard. Thus the dragon's blood serves to protect the sides of the lines, as well as their top surfaces. At last all the lines of the drawing stand up clearly on the zinc plate. The plate then goes to the "machine room," where all the useless zinc is cut away, leaving only the line engraving, which is then mounted on a block of metal to make it type high. It is then ready to print from.

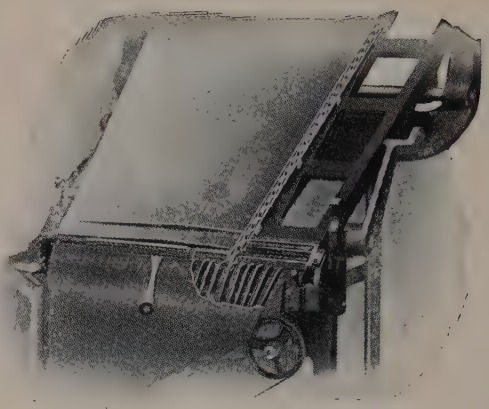
You notice that most of my pictures are made up of little dots. Such pictures are what are called "half-tones." Half-tones are made on copper. A negative is made from a photograph, a wash-drawing, or an object, just as for a zinc etching, but in this case the negative is made through a glass screen that is placed in the camera just in front of the sensitized glass plate. This screen is composed of ruled lines crossing each other diagonally. The number of ruled lines on this screen vary from 65 to 200 to the inch. My pictures have 120

Two of the Little Type Makers

These are two of the little type makers, or matrices, in which the type which make up a line, are cast. One of them has one letter, you see, and the other two. The two-letter matrices may have one letter with a Roman face while the other may be Italic, small capital, or some other kind of type. The advantage of this is that if a line is to be composed partly of Roman face and partly of another face, the operator, by moving the lever, can determine which letter is to be cast. The principle is the same as that of the shift-key and double lettering in a typewriter.

lines to the inch. When the negative is developed it is composed of tiny dots made by the light penetrating between the lines of the screen. These dots make fine, broken lines, that reproduce the most delicate shadings of the copy. The lines in zinc etching or line engravings, you notice, are continuous and unbroken.

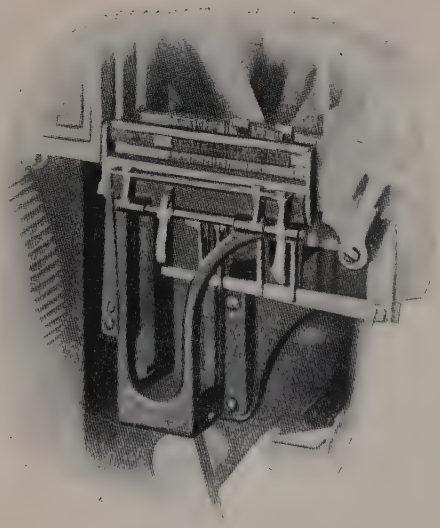
Matrices Waiting to be "Called"



The space where the matrices are kept until they are wanted is called the "magazine." This picture shows the magazine with a portion of its cover removed to show a row of letters in their compartments. All letters in a given compartment are of one kind. When the operator presses the corresponding key on his keyboard, it releases one of these matrices and down it comes "like a boy on a toboggan slide." As the different letters follow, they line up beside one another in the assembler, like soldiers standing at attention.

The colored pictures are also made from half-tone engravings, three engravings being required for each picture. One engraving is to print in yellow, one in red, and the other in blue. Yellow, red and blue are the three primary colors that you learned about in school. From them all other colors are produced. By the three-color process the yellow plate is printed first. The red plate is printed right on top of the yellow. The blue plate is then printed on top of the yellow and red. These three plates are made separately and a negative is required for each plate. In making the negative for the yellow plate a "color filter" is placed

The Assembler

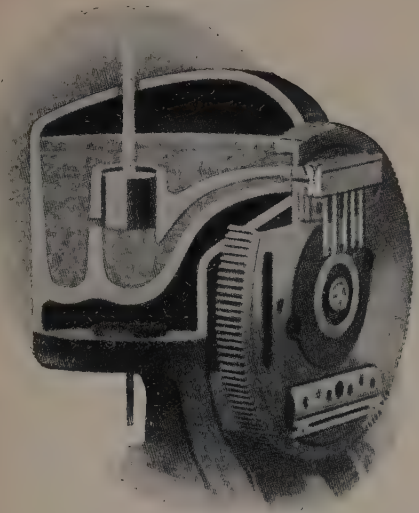


This is the assembler. It holds the matrices of the type together much as a man setting type by hand holds them in his "stick." It has quite a lot of machinery about it in order to take care of the proper adjustment and spacing of the matrices as they drop down into line.

The Linotype Keyboard

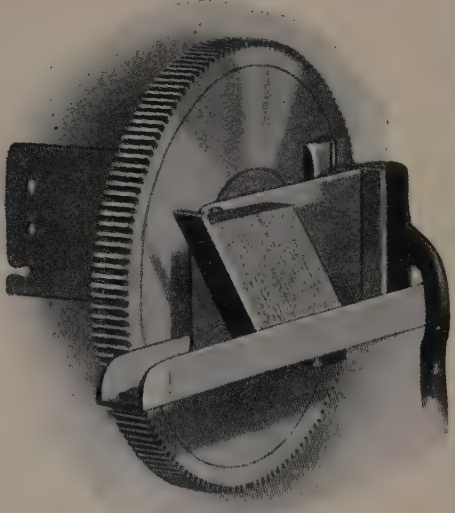
This is the keyboard of the linotype. You see it is constructed on the same principle as the keyboard of a typewriter. The bar just above the keys is called the space bar. When the operator touches this bar it lets down a matrix with a blank face which thus makes a space between the words. After the assembler has been filled, the operator presses down the handle on the right which causes the whole line to pass to the front of the melting pot.

Inside the Melting Pot



Here you see the inside of the melting pot and just how the plunger forces the metal up a tube like the stem of a tobacco pipe and fills the matrices. The line, after it is cast, you see, lies horizontally. Just pausing long enough for this thin line of metal to harden, the wheel revolves, thus bringing the slot you see on the left opposite the opening in the casting box and carrying the type which has already been cast so that it assumes a vertical position. The next picture shows what happens to this bar.

How the Type Gets into the Galley



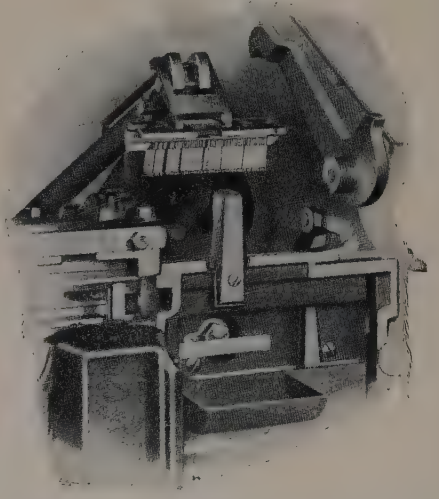
The galley is a kind of tray to hold type after it has been set. The picture shows a number of linotype slugs in one of these galleys and the new one, which has just been cast, as shown in the previous picture, is about to be added.

over the lens of the camera. This filter leaves out all the red and blue that is in the copy, and photographs only what is yellow. In making the negatives for the red and blue plates other filters are placed over the lens, leaving out all other colors in the copy, except the red or blue. When the three plates are printed the combination of the three colors form a picture, which is the exact reproduction of the painting from which it was made.

How and Why I Go To Bed

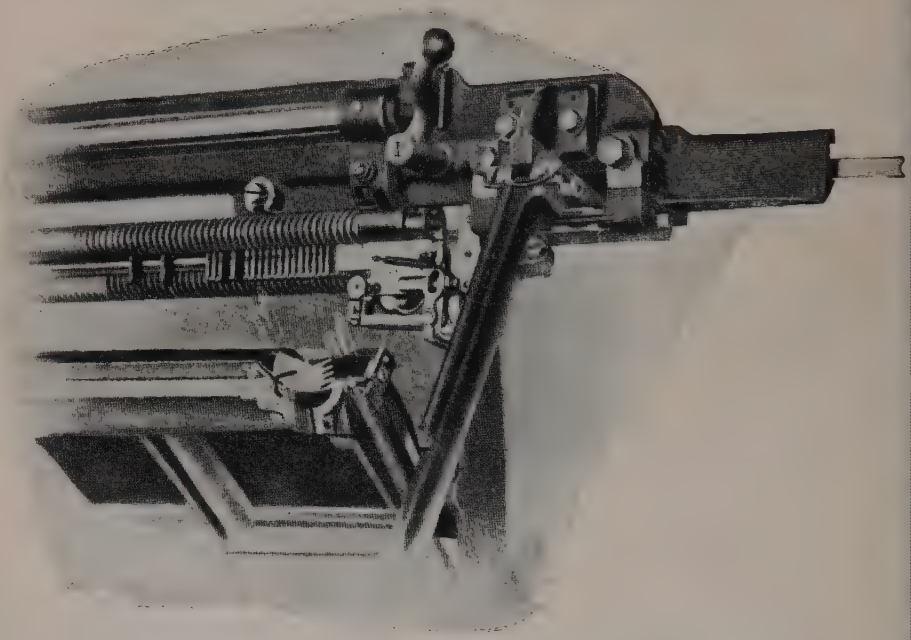
Now it is time to go to bed. To sleep? No, indeed! I'm busiest of all when my electrotype pages are put on the bed of the printing press. Half of them are upside down. Page ten is next neighbor to page twenty-three and so on. Fold a sheet of

On the Way Back to Their Pens



Here is a row of matrices on their way back to the distributor which will drop each of them into its pen. They are here shown attached to the distributor bar which is provided with grooves and ribs corresponding to the teeth in the matrices. The matrices are pushed along the bar by a conveyor screw until they reach the point where the ribs on the bar correspond with the teeth in the matrices. Then they let go and drop into the respective channels of the magazine out of which they originally came.

The Little Type Makers Returning Home



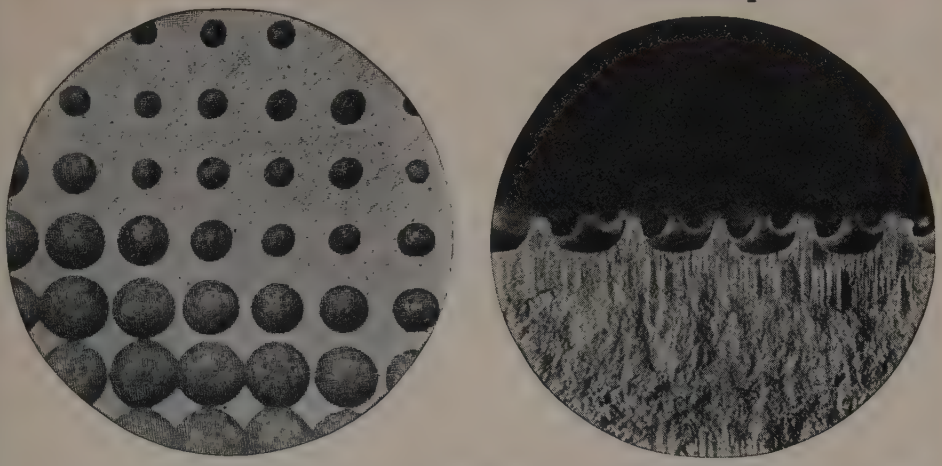
Just watch the little brass molds go home again. Each one has notches like a Yale door key, and the notches on each matrix are different from all the rest. These teeth are in the "V" on the upper end. In the picture you see what seems to be a long screw. This is called the "distributor bar" because it distributes the matrices back into their proper places. The threads or ribs on the bar vary in number and arrangement at different points along the bar, to correspond with the arrangement of the teeth in the matrices. So you see what happens; the matrices are carried along by the screw-like motion of the bar until they reach a point where the ribs on the bar exactly fit into the teeth in the matrices. Then, presto! The matrices let go and drop down into the little pen or channel where they belong, and stay there until they are wanted again.

paper to make sixteen leaves or thirty-two pages. Number the pages, without cutting them, and then unfold the paper and you will see why my pages are laid out this way on the press. Thirty-two of my pages are printed on one side of a sheet and thirty-two on the other side. Printers have to arrange those pages so that when the sheet is folded, the printed plates will be where they belong. On the press bed, I feel like a Chinese puzzle, and am *so* relieved when everything comes out right.

As a sixty-four page form—so they call it—comes from the press it runs between two sharp edged wheels that fit together like the two blades of a pair of scissors. This cutter slices the sheet into two sections of thirty-two pages each—sixteen on one side and sixteen on the other.

When the sheets first come from the press, the ink is not dry and pictures and reading matter would be smudged, if handled. After having been given time to dry, the sheets are taken to a folding machine into which they are fed. At the folding machine a very funny thing happens, for right at the "entrance," so to speak, a pair of steel fingers with rubber cups on the ends of them, like the suction cups on a fly's foot, and working on the same principle, take hold of the edge of the sheet,

The Little Dots Under the Microscope



If you will look closely at certain of the illustrations in Pictured Knowledge, you will note that they are made up of little dots. The two illustrations here given show how these dots look under the microscope. Where the shading in the picture is light the dots are smaller and farther apart; where the picture is darker the dots are larger and closer together. This is very clearly shown in one of our microscope pictures. The picture on the right shows how the half-tone would look if cut through. You see the "dots" stand up and do the printing.

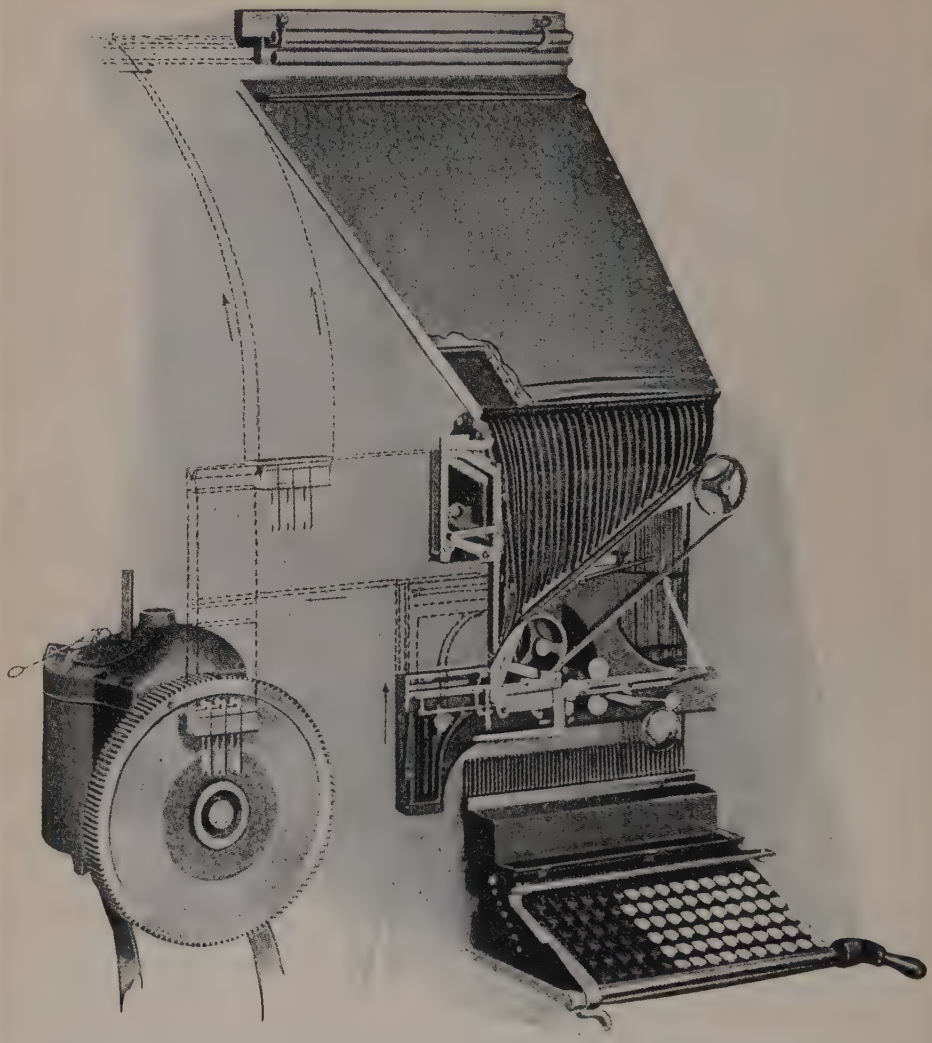
pull it forward and stick it between two webs, running over rollers. The rollers draw the paper in much as the two rollers on a clothes wringer draw in the cloth, and it is carried forward on the webs to a point where the sheet is just above two other rollers.

At this point in the proceedings a frame comes down and pushes the sheet between these rollers which draw it through as you would run a folded cloth through a wringer, thus making a fold. Then the sheet, folded once, passes down to another web, frame, and roller combination, and so on until it has been folded three times, and sixteen pages follow each other as you have them in the book.

Oh, yes, the ink! A five-cent bottle lasts you a long time, but barrels of ink were used on me. And it is thick ink, made of lampblack, oil and varnish, ground in big tanks and mixed with a paddle. For the colored pictures, the inks look like the pots of paint of a house decorator. The ink flows from a fountain at the end of the press. It flows onto a table. It is taken up on big rolling pins, and is spread evenly over the type. Guess what those ink rollers are made of. Glue and molasses. They are soft and elastic as if made of rubber. The glue and molasses were boiled as thick as taffy and poured on wooden cores, in iron molds to harden. The press bed is a moving table. In front, it is inked for every printing. Then it runs under a rolling cylinder with a sheet of paper wrapped around it. The sheet is printed, the table is moved forward for another inking, and the cylinder gets another sheet from the shelf at the back. A boy feeds the press with paper. He pushes a sheet up until some steel fingers reach out, catch the edge and draw it in. Then a sheet is printed, other fingers gently lift it out and lay it aside to dry. When dry the other side is printed.

Molasses, But Not for Candy

Summing Up the Story



This picture sums up the whole story of the linotype and its work, so that you can see the relation of all the different parts we have been describing. Here, as in a previous picture, the cover of a portion of the magazine is removed so that you can see the "alleys" down which the letters come. The belt which carries the matrices along and lines them up for the casting machine is also shown.

The dotted lines and the arrows show you how the assembled line of matrices, just sufficient to make a line of type of the proper width, is lifted up and carried across and down in front of a slot in the cogged wheel where molten metal is forced through from the melting pot back of the wheel there, into the matrices, and so casts the line of type into a solid bar.

After the bar has been cast, that particular line of matrices is through with that job and so is carried up as you see by the arrows and that dotted line, to the distributor bar at the top of the magazine. This distributor bar causes each little matrix to find its own "pen," as described in the article.

An Artist at Her Work

This picture shows an artist at work in the Art Department of Pictured Knowledge. A drawing, as you see by the one on her drawing board, is made much larger than the reproduction of it which appears in a book, because when working on a large scale, the artist can handle the details of the picture more easily. Resting on the bookcase you will recognize two of the illustrations in the Little Folks' section of Pictured Knowledge. Here you meet the clever artist who drew them, Miss Betty Harris.

Big newspaper presses fold the papers and drop them in a big box.

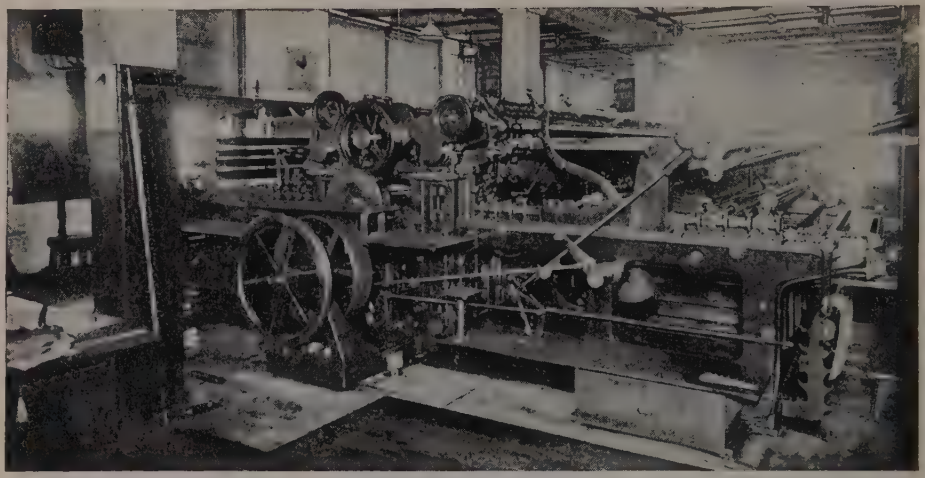
Open me carefully. You can see that I am made in sections of sixteen pages each. All of my sections were gathered up by pretty girls in the book bindery. Then I was put into a "smashing" machine to be squeezed into a solid book. One machine sewed the sections together and another cut the edges. My back was rounded and front hollowed. (Children should be just the other way.) Coarse cloth was glued on the back, with an inch extending over each edge. Then stout paper was glued on. The cloth edges and fly leaves were pasted into the cover.

The whole cover was made by pasting. Then the cloth was put on the sides; all the edges were turned over and glued down and the back lined. Presses made the ridges across the back and pressed in grooves for hinges. This is why it is so easy to open my front door.

A book is like a house. It has a name plate on it, so people will know who lives inside. A special workman put my name on in gold letters. He had a brass die with the name cut in it. He pasted a strip of gold leaf on in the right place, with thin glue, and then pressed the heated die into the gold, cutting around the letters and pasting them down. See my bright gold name plate?

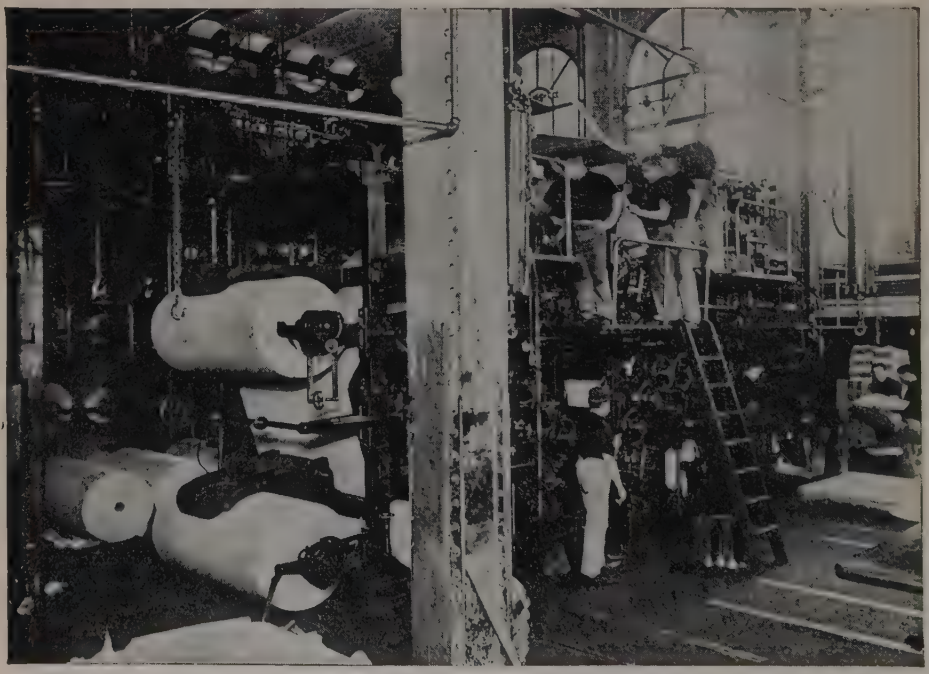
"Pictured Knowledge" lives here. Come on in. The stories and pictures are fine!

The Machine that Does the Printing



Here is a picture of one of the many presses upon which the pages of Pictured Knowledge are printed. On the right hand you see the "rolling pins" which spread the ink over the type. Underneath them is the moving table which carries the made-up type pages. On the left, leaning against the pillar, is another roller ready to take the place of one on the press in case of accident.

In the Press Room of a Great Daily Paper

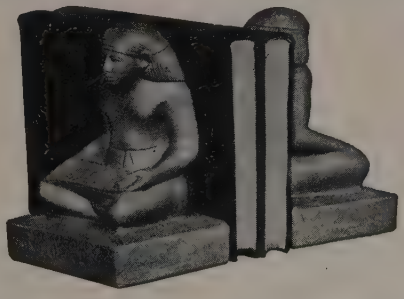


This shows one corner of the press room of one of our great newspapers, the New York Herald, with the men at their posts. The pipes you see convey air used in connection with the hoists for raising those great rolls of paper. The man on the right of the pillar is the "brakeman" who starts and stops the press. The two men on the platform on the top of the stairway are putting the plates on the press. The man back of them with the sheet in his hand is the pressman, who stands in the same relation to the press that the captain does to a ship; he is in general charge. Here you see him looking at a printed sheet which was run off before the men put on the new plates. He wants to see if everything is printing properly.

Books for the Blind and How They Are Read

Just think what a blessing it is that even the blind can read books, although they can no longer see. In books for the blind the letters are raised by being punched into thick paper from the underside. Blind people become very expert in making out the letters by passing their fingers over them. Here in the picture one old gentleman, in an asylum for the blind, is reading to another.

Book History in a Pair of Bookholders



The above picture is a kind of summary of the history of books. It shows an Egyptian scribe with a papyrus roll spread out in his lap, reading aloud. You know it was the Egyptians who first made a kind of paper from the papyrus plant which grows in Egypt. They cut the pith of the plant into long strips, arranged them crosswise in two or three layers, soaked this mat in water and then put it under weights which pressed it into a sheet. You also see where we get our word "paper," don't you?

The Fern and the Moss

There was a fern on the mountain, and moss on the moor;
And the ferns were the rich, and the mosses the poor.
And the glad breeze blew gayly, from heaven it came,
And the fragrance it shed over each was the same;
And the warm sun shone brightly, and gilded the fern,
And smiled on the lowly-born moss in its turn;
And the cool dews of night on the mountain fern fell,
And they glistened upon the green mosses as well.
And the fern loved the mountain, the moss loved the moor,
For the ferns were the rich, and the mosses the poor.

But the keen blast blew bleakly, the sun waxed high,
And the ferns they were broken, and withered, and dry;
And the moss on the moorland grew faded and pale.
And the fern and the moss shrank alike from the gale.
So the fern on the mountain, the moss on the moor,
Were withered and black where they flourished before.

Then the fern and the mosses they grew wiser in grief,
And each turned to the other for rest and relief;
And they planned that wherever the fern roots should grow
There surely the moss should be sparkling below.

And the keen blasts blew bleakly, the sun waxed fierce;
But no wind and no sun to their cool roots could pierce;
For the fern threw her shadow the green moss upon,
Where the dew ever sparkled undried by the sun;
When the graceful fern trembled before the keen blast,
The moss guarded her roots till the storm wind had passed;
So no longer the wind parched the roots of the one,
And the other was safe from the rays of the sun.

And thus, and for ever, where'er the ferns grow,
There surely the mosses lie sparkling below;
And thus they both flourish, where naught grew before,
And they both deck the woodland, and mountain, and moor.

ELIZA COOK

Masterpieces of the World of Art

The Last Supper, by Leonardo da Vinci

ART not only speaks the most beautiful language in the world but it often tells in an instant what no amount of words could convey so clearly.

A portrait or a landscape on a wall, for example, really describes the person or the scene represented; describes it so well that no one would think of hanging up a framed description in words in place of either. It is true that some things can be told in words better than in pictures but, on the other hand, there are things in pictures that can not be put into words.

Yet, although it has been truly said that art is a "universal language," and, therefore, a language which everyone can understand, it tells most to those who understand best. So it would be a strange kind of education that taught us only how to read books and nothing about how to read great works of art. And since we get the most out of books when we learn to like the great works of literature, art will enrich our lives in proportion as we become familiar with and learn to appreciate its masterpieces.

In the reproduction of masterpieces in this department of Pictured Knowledge, what are known as the Old Masters are given first, followed by the work of modern painters. Then come the great works of sculpture and famous monuments, including the work of the Egyptians and the Greeks. In the case of the Old Masters and modern artists, the nationality and date of birth are given, so that you can not only study the work of the individual artist, but become familiar with national characteristics in art and observe the changes in style from one period to another, similar to those which mark the development of literature.

That art is only a form of expression is strikingly illustrated in the origin of the famous picture with which this department begins, "The Last Supper," by Leonardo da Vinci. Before he put the painting on canvas, he pictured the scene to himself in words and wrote it down in his notebook. For example:

"One of the apostles is about to drink, but leaves the glass in its place, and turns his head towards the speaker."

"Another whispers in the ear of one who hearkens, bending towards him and holding his ear close to him, whilst in one hand he holds a knife and in the other the bread, which is half cut by the said knife."

These notes are of more than curious interest. They not only emphasize the important relation of art language and word language, but they show us into a great man's mind and we see the care and patient industry with which all good work is done.

A similar practice is illustrated in an anecdote of a modern master of American birth, James McNeill Whistler, whose famous portrait of his mother will be

found among these reproductions. Walking in London one evening with a friend, the latter called his attention to a striking effect of a sunset with a sky line of buildings.

"I want that," said Whistler, and stopping, he studied the scene intently for some time. Then turning his back on it he said to his friend, "See if I can recite it," and he described minutely the features of the scene.

On the way back to the studio his friend called his attention to another view. "No," said Whistler, "one thing at a time." And as soon as he got to his studio he began putting one of his famous "nocturnes" (night scenes) on canvas; the sunset which he had just learned and recited.

You will also find when you are trying to draw something at school or in the little evening group at home, that your picture will be much better if you first describe the object either to yourself or to someone else; as to its dimensions, resemblance of its parts to other forms or objects, etc.

You will also find that the better you learn to draw, following the instructions in our Department on Drawing, the more you can see and appreciate in the work of the masters. It was to develop appreciation of art rather than to make more artists, that the Greeks, the greatest of all nations in art, taught drawing in their schools. They did this that the little Greeks might get the most out of the art which they saw everywhere around them. In sculpture alone this little nation left so many and such marvelous works, that one might suppose that every other boy became an artist, if it were not for the fact that they also produced poets, orators, statesmen, architects, generals, mathematicians, and philosophers—so many and so great.

And the greatness of the Greeks in every line was in no small measure due to the clear seeing and clear thinking which grew out of the fact that art was so intimate a part of their religion and their daily lives. That statue of the "Winged Victory," for example, was a prayer of thanksgiving in marble.

The Praying Hands, by Albert Dürer

Albert Dürer (German, 1471)

LIKE Da Vinci and Angelo, Albert Dürer was a man of many talents—sculptor, architect, painter, and etcher. He was also a man of strong religious feeling and expressed this feeling in the books he wrote, but above all, in his art. Even in the picture of the hands raised in prayer he has put a world of adoration and humble trust. To even draw hands correctly is one of the difficult things in art; and to make them express thought and character, as Dürer does here, is still more difficult.

Mona Lisa, by Leonardo da Vinci

Leonardo da Vinci (Italian, 1452)

THIS is one of the most famous portraits in the world. It owes its reputation, not alone to its great artistic merit, but to the mystery in the lady's face. Upon one point the critics are agreed, and that is, that it expresses the painter's ideal of womanly beauty and his conception of the mystery, not only of human life, but of inanimate nature symbolized by the mountains and the grace of the curving stream in the background. While Leonardo was painting the beautiful Mona Lisa, he kept someone near her to sing or play or jest or amuse her, that she might continue cheerful.

Jeremiah, by Michelangelo

Michelangelo Buonarroti (Italian, 1474)

THIS figure of Jeremiah is one of the seven figures of prophets in Angelo's colossal painting, "The Last Judgment," in the Sistine Chapel. The prophets and also the sibyls, who were the prophetesses of Greece and Rome, and are represented as foretelling the birth of Christ, occupy spaces in the ceiling. The great artist's conception of Jeremiah, who is often called "The Weeping Prophet," is the most striking of all. His profound sorrow over the sins of his people and the calamities that must befall them is expressed in both face and attitude. One of Angelo's distinctions was his perfect knowledge of anatomy, to which he devoted twelve years of study. The fact that he was a sculptor led him to emphasize the muscles in the human form.

St. Christopher and the Christ Child, by Titian

Titian Vicilli (Italian, 1477)

TITIAN has here told with his brush an interesting legend. St. Christopher's original name was Offerus, and he was the son of a heathen king. He was of extraordinary size, as you can see. He was correspondingly strong, and started out into the world to offer his services to the strongest and bravest. For a time he served Satan, but left him when he saw Satan frightened at the sight of a roadside cross. Later a Christian hermit baptized him and named him Christopher. The name was prophetic, for it means "Christ bearer." One day when St. Christopher was carrying people across a stream, in the service of God, he took a little child on his shoulder, but found the weight so heavy that, giant as he was, he could hardly carry him. This is the episode told in the picture. The child of course, was the Christ Child.

The Sistine Madonna, by Raphael

Raphael Sanzio (Italian, 1483)

THE Sistine Madonna is probably the most famous painting in the world. The great merit of the picture lies in the beauty and purity of the mother's face and the remarkable combination of baby innocence and mature wisdom in the face of the child. The treatment is very simple. Relatively few lines, for example, express the flow of the draperies in the breeze, as the mother advances with the child through the clouds, typifying the fact that she brought the Christ Child to the world. Here we have reproduced the two most striking figures in the painting, that of the Christ Child and his mother. As no sketch is known to have existed for this picture, it is thought that Raphael painted it directly upon the canvas without the preparatory studies of separate figures, which nearly always precedes the beginning of a painting in its final form.

Only Raphael's wonderful skill as a draughtsman enabled him to do it.

Bacchus, by Guido Reni

Guido Reni (Italian, 1575)

GUIDO RENI owed part of his fame to his skill in painting classical subjects. His masterpiece is "The Aurora," which represents Apollo, the god of day, starting out in his chariot attended by the Hours represented by female figures, after the manner of the Greek myths. The painting here reproduced is his conception of the childhood of Bacchus, the classic god of the vineyard. You notice the little children are crowned with vines and grapes, and their whole attitude, as well as the expression of their faces, tells of the happy time of harvest and the vintage.

The Garland of Fruit, by Rubens

Peter Paul Rubens (Dutch, 1577)

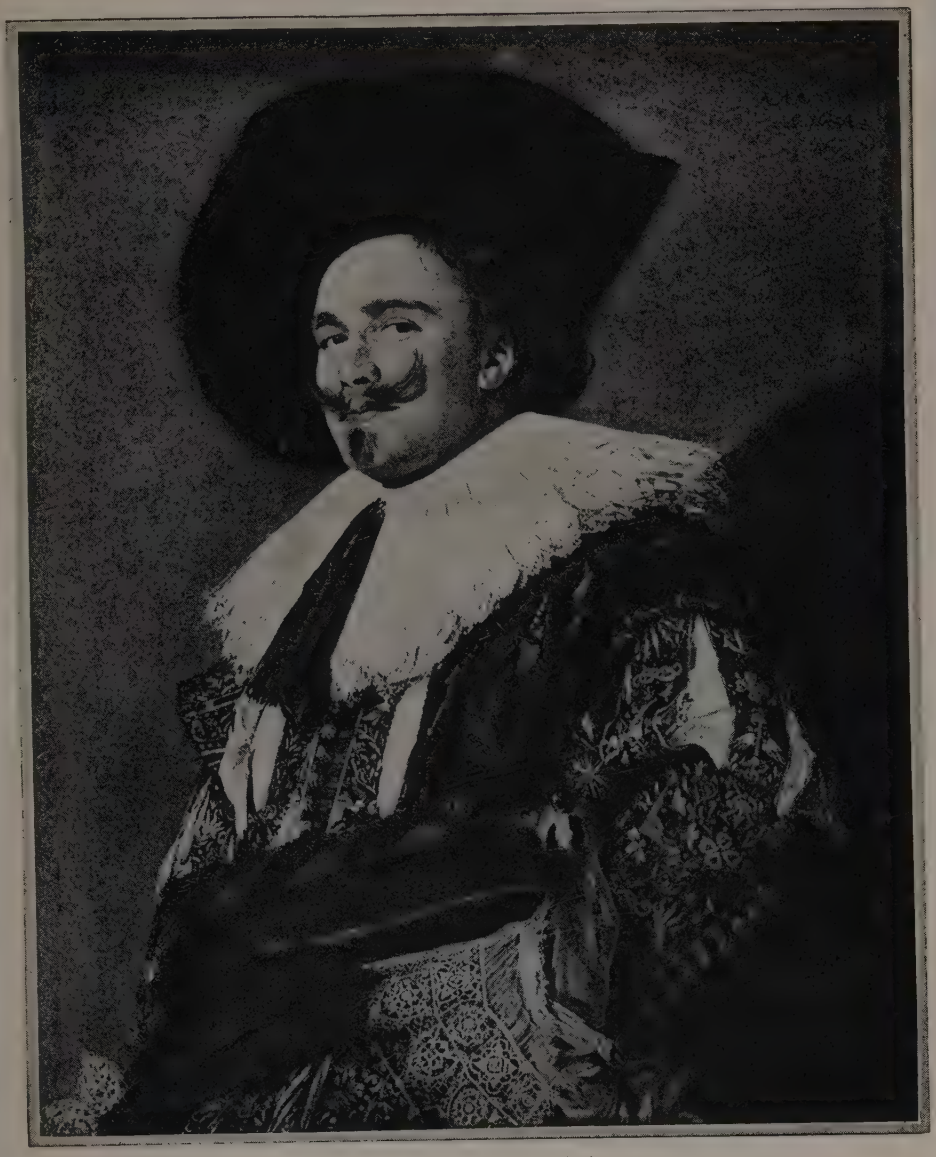
ANOTHER picture of happy children, symbolizing the fruit time of the year. Notice how beautifully the little figures are grouped to correspond with the shape of the circular garland they are carrying. "Composition" is one secret of great art.

The Surrender of Breda, by Velasquez

Diego Rodriquez de Silva y Velasquez (Spanish, 1599)

VELASQUEZ was distinguished not only as a portrait painter but as a painter of historic subjects. This picture is in the Prado (Royal Picture Gallery) in Madrid. It represents the Marquis de Espanola, a famous Spanish general and friend of the artist, receiving the keys of the city of Breda, which he has just captured. Note that the conqueror treats the defeated general with the greatest courtesy.

The Laughing Cavalier, by Hals



Frans Hals (Dutch, 1580)

THIS picture has won its fame under the title of "The Laughing Cavalier," although as you can see plainly, the gentleman is not laughing. He has something of a smile, to be sure, but it is a smile of irony. Somebody has apparently told him something—and he means to say by this smile: "You would hardly expect a man of the world like me to be taken in by that story, would you?" People smiling and laughing are among the favorite subjects of the brush of this famous artist. He painted very rapidly and got his results with relatively few quick strokes of his brush. Vandyke was also famous for the rapidity and certainty with which he used his brush.

Madonna with the Donors, by Vandyke

VANDYKE was a pupil of Rubens. He seems to have inherited artistic talents from his mother, who was a skilled worker in embroidery and tapestry. Although he belonged to the Flemish School of painters by birth and training, he spent much time in England, where he painted the King and members of the Royal Family, and got his title of "Sir." The picture "The Madonna with the Donors" is one which was painted as a gift to the Church, and as was often done, the artist included the portraits of the donor and his wife in the picture. The Virgin has the typical face of the aristocrats whom Vandyke was accustomed to paint. The child with one hand holds his mother's finger, and with the other is stroking the cheek of the donor.

Sir Anthony Vandyke (Flemish, 1599)

Bartolme Esteban Murillo (Spanish, 1617)

The Beggar Boys, by Murillo

ALTHOUGH equally famous as a painter of sacred subjects, Murillo was very fond of painting the happy-go-lucky street boys of his native country; and particularly boys of the city like those shown in the picture. All these boys were rich and happy because, although they had nothing, they were used to doing without what they didn't have. Enough to eat, a sunny place in which to play, was all they asked of life. Another painting by Murillo called "The Melon Eaters" almost exactly reproduces the figures in this picture. Another shows three little beggars squatting by a ruined wall.

The Syndics, by Rembrandt

Rembrandt Harmens van Ryn (Dutch, 1606)

THIS picture of the "Syndics" (government officers) brings out two of Rembrandt's greatest characteristics—his expression of character and his striking contrasts of light and shadow. On account of this phase of his genius he has been called the "King of Shadows."

The Waterfall, by Ruysdael

RUYSDAEL was a poet who wrote his poetry with a brush. He expressed the poetry of the woods and sky, and the grace of the waterfalls. Notice the sharp contrast of light and shadow in this landscape and compare it with the handling of shadows in the group of faces in Rembrandt's "Syndics."

His pictures have been called romantic because they suggest all sorts of romantic things—fairies, knights riding forth in quest of adventure—anything you like.

To most people there is also a pleasant feeling of melancholy and loneliness about his pictures. The sense of being alone with Nature is, to everyone who loves her in her various moods, a very agreeable one. A picture of Niagara Falls with a lot of people in the scene, for example, is not nearly so appealing as the Falls alone.

Jacob Ruysdael (Dutch, 1625)

The Avenue of Trees, by Hobbema

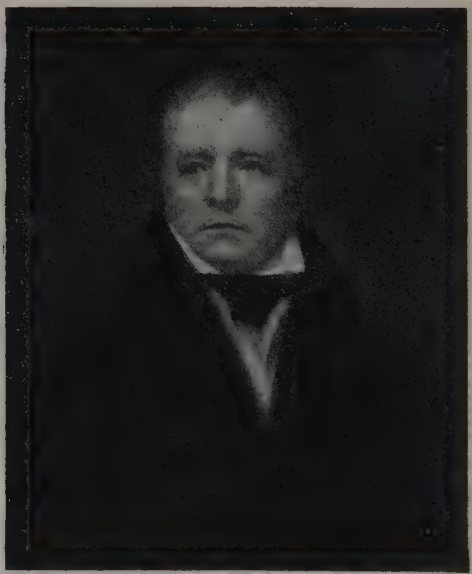
Meyndert Hobbema (Dutch, 1638)

HOBBEMA is another great Dutch landscape artist, and like most distinguished landscape painters, he chose his subjects from his native land. You have only to look at this picture to see that it is the level landscape of Holland.

Work of Reynolds and Raeburn

Angels' Heads by Sir Joshua Reynolds (English, 1723)

REYNOLDS is the most famous of English portrait painters. The picture called "The Angels' Heads" is, in reality, a portrait of little Lady Gordon in five positions.



Sir Walter Scott by Sir Henry Raeburn (Scotch, 1756)

SIR HENRY RAEBURN was the most famous of the Scotch artists of his time. He produced strong, broad effects by comparatively few swift strokes of the brush.

Ulysses Deriding Polyphemus, by Turner

J. M. W. Turner (English, 1775)

THIS is one of the most celebrated pictures of one of the most famous of all painters of landscapes and the sea, the English artist, Turner. The event referred to in this picture is one you know about from reading the myth stories. Polyphemus was one of the Cyclops —dreadful big giants with only one eye, right where the little girl had that beautiful curl—in the middle of his forehead. Polyphemus lived in a cave on the coast of Sicily, and although he had large flocks of sheep, he also ate people, as did that giant Jack killed. Odysseus returning from Troy, landed on this coast with his companions and Polyphemus had shut them all up in a cave to keep for his meals, blocking the cave with a big rock. But Odysseus, who had a great deal of practice in getting out of the troubles into which he was constantly falling, put out the giant's eye while he was asleep. Then he and his companions hurried down the shore to their ships. But they had just fairly started when Polyphemus, blinded as he was, made his way to the shore, and proceeded to hurl a big rock down where he thought they must be. As he could no longer see to aim straight, however, neither Odysseus, nor his companions and ships, were touched and Odysseus mocked the furious giant as they rode away on the sea. According to Homer, this is what he is saying in the picture: "Cyclops, if any mortal man asks you the story of the blinding of your eye, say that Odysseus made you blind." The arched rocks you see in the picture are the ones you have noticed often in the reproduction of the painting of the island of Capri, used in your picture studies in school. "Ulysses" is the Roman name for Odysseus and Turner chose it in naming his picture.

A striking feature of Turner's work is the blazes of colored light such as you can see suggested in the sun's rays here. Ruskin, the great English art critic who did more than anyone else to make Turner famous, has this to say of the sky in this picture:

"The whole heaven—one scarlet canopy—is interwoven with a woof of waving flame, and tossing, vault beyond vault, as with the drifted wings of many companies of angels. . . . When you can look no more for gladness, and when you are bowed down with fear and love of the Maker and Doer of all this, tell me who has best delivered this, His message unto men!"

Turner contributed 259 pictures to the Royal Academy, and over 19,000 drawings and sketches were mounted and arranged by Ruskin. His illustrations of the poems of Rogers, Byron, Scott, and other authors are well known. Among his paintings are Dutch Boats in a Gale, Falls of the Clyde, Sun Rising through a Mist, The Fighting Temeraire, Bay of Baiæ and Childe Harold or Modern Italy.

His large fortune was left to found a home for needy artists. Wasn't this a fine thing for a great artist to do?

Castle Grandolfo, by Corot

Jean-Baptiste Camille Corot (French, 1796)

THERE is always a spirit of joyousness about Corot's paintings that reminds one of the song of birds in spring. And they nearly always have a suggestion of the air and the light and the odors of morning. It was always at the very earliest morning hours that he went out to paint. Indeed, he thought getting up early in the morning was one of the most delightful things anyone could do. Once in a letter to a friend he said, "The landscape painter's day is delightful. He gets up at three in the morning, before sunrise, and watches the way everything trembles in the freshing breeze of dawn."

Constant Troyon (French, 1810)

Returning from Market, by Troyon

LIKE Corot, Troyon was a great French landscape artist, but unlike Corot, he made figures of people and animals prominent features of his pictures. He also loved the morning and evening lights and their long shadows. As one critic says, he had "a quick sense for light." In the picture here produced, the light is from the setting sun, as the farmer and his wife and boy are returning from market. Like many other artists, Troyon seldom completed one subject before he took up another, working on a number of pictures at the same time and passing from one to another as a thought occurred to him.

The Gleaners, by Millet

Jean Francois Millet (French, 1814)

NO ONE has expressed the life and simple dignity of the French peasant so well as Millet. He was himself a farmer boy, and this picture of "The Gleaners" is one of his most famous works. Like Angelo, he was a close student of the human form. Notice how forcibly he brings out the shape and movements of the body here. The figures, although clothed, look like moving statues.

Although in the beginning of his career he painted classical subjects, he soon abandoned this field and devoted the rest of his life to painting scenes in the lives of the peasants of France. His pictures give a complete study of the life and character of the French peasantry which it would take several volumes to explain if the same subject were dealt with in print. Millet's work differs from other famous artists, such as Jules Breton, who also devoted themselves to painting the lives of peasants. You no doubt know Breton's "Song of the Lark." Breton put a good deal of poetic sentiment into his pictures, while another famous painter in this field, L'Hermitte, expressed the protest against a state of society in which people toil so hard and get so little out of life. Millet, however, simply painted the peasant as he is, without any comment one way or the other.

Millet used to amuse his children and his grandchildren by making little sketches. They are comparatively crude, as are the first sketches made by an artist when compared with his finished work. One of them shows a child trying to blow out a candle. It was made for the artist's first grandchild before he could talk. Millet used to draw many things in this way to see if the baby could recognize them. When he made this sketch and showed it to little Antoine, the baby looked at it for a moment and then turned and blew at a candle which was standing on the table. The candle is shown very large in proportion to the human figures. It was made large to attract the baby's attention. In commenting on it to an American who was visiting him, Millet said, "This well illustrates a principle in painting. It is necessary to exaggerate or to bring things out in strong relief at times in order to produce the proper effect."

These sketches were made with a match dipped in ink so that the lines would be good and strong.

Jean Louis Ernest Meissonier (French, 1813)

The Print Collector, by Meissonier

THE art of Meissonier and Millet dealt with entirely different subjects and there is an equally striking contrast in their methods. Millet got his results with a few simple strokes, while Meissonier's work is distinguished by its incredibly minute detail. Most of his pictures were painted on very small canvases, and the detail is brought out with the minute accuracy of a photograph. No one has ever excelled, few have ever approached him in his chosen field. Nearly all his paintings are military scenes. His masterpiece, "Friedland—1807" is in the Metropolitan Museum, New York City.

Menzel, a German artist, an example of whose work appears below, was also distinguished for the detail in his pictures and his work has been compared by the French critic, Michel, to that of the French masters, which is the highest compliment a French critic could pay.

A Concert at the Court of Frederick the Great, by Menzel

Adolf-Friedrich-Erdmann Menzel (German, 1815)

Whistler's Portrait of His Mother

James McNeill Whistler (English, 1834)

ALTHOUGH Whistler was born in America, he spent his art life in England and so is classed among English painters. He was a painter of landscapes, of portraits, a decorative artist, and an etcher. In all these lines he ranked among the first. His portrait of his mother is one of the most famous of the world's great pictures. It is extremely simple in arrangement and treatment. The face wears the dreamy expression of those who live rather in the past than in the present. Joseph Pennell, the famous American etcher, speaks of the expression of resignation in the tired old folded hands. The face is wise and strong, full of courage and resource, and at the same time of tenderness, piety, and resignation. Only writers and artists can fully appreciate what infinite toil is required to reach the simplicity of this picture. It seems to express the beauty of motherhood, like the one word "Mother"—without adjectives and florid sentiment. Not a touch is wasted and there is no trace, except to those who know how long it takes to write a short letter, of the amount of work really expended on it.

Whistler was deeply attached to his mother, and her influence was a dominant feature in his life. To the public, one of Whistler's characteristics was his cynicism; but in this picture he takes off the mask and shows us the real man. One of his biographers relates how once when he was visiting Whistler, they stood together looking at this picture. "I spoke at length," he says, "of the beauty of the face and figure. For some time Whistler said nothing, his hand was playing with the little tuft that he wore on his lower lip. Finally he spoke.

"'Yes,' very slowly and very softly, 'one does like to make one's Mummy just as nice as possible.'"

It was because Carlyle liked this picture that he himself consented to sit to Whistler.

The Monarch of the Glen, by Landseer

Sir Edwin Landseer (English, 1802)

LANDSEER, like Rosa Bonheur, devoted his life to the painting of animals, and the deer in his native haunts among the wild mountains of Scotland was one of his favorite subjects. "The Monarch of the Glen" shows a magnificent stag with his head thrown back, in the characteristic way, looking about for signs of danger or the presence of a rival. Behind him are his native crags and the Scotch mists. What an air of wildness and solitude the artist has put into this picture. Another painting of a deer, which is full of pathos and offers a bitter comment on the kind of sport which finds pleasure in hunting and killing these beautiful creatures, is called "The Sanctuary." A stag, desperately wounded, is just struggling up on the shore of a lake which he has swum across to reach an island where he will be safe, for a time at least, from the cruel hunter and cruel dogs. The scene is at twilight and you can see the evening glow along the low-lying hills. Another picture shows a stag in the dead of winter, with snowy mountains all about him and the stars glittering overhead, calling a challenge across a lake to one of his rivals. "The Deer Pass" shows a group of deer among mountain peaks and morning mists.

Landseer was perhaps even more famous as a painter of dogs; not because he painted them any better, but because he painted so many pictures of dogs and brought out so many phases of their noble lives.

Of his picture "The Highland Shepherd's Chief Mourner," which shows a shepherd dog with his head resting on his master's coffin, Ruskin says in his "Modern Painters":

"[It is] one of the most perfect poems or pictures (I use the words as synonyms) which modern times have seen."

Weaning the Calves, by Bonheur

Rosa Bonheur (French, 1822)

ROSA BONHEUR shares with Landseer the distinction of being the most famous of animal painters. She came of an artistic family. She was the oldest of four children, all of whom were artists and all devoted their art to animals. Auguste painted both animals and landscape. Juliette painted animals and Isidore was a sculptor of animals. Rosa's father, who was also an artist, taught her to draw. Her work was extremely accurate and also as a critic put it, "manly and firm." The work of women artists is often delicate and hesitating. Wherever she introduces human figures into her pictures, there is a marked difference in treatment, the figures being treated as if they had comparatively little interest for the artist. Painters, like the rest of us, are apt to emphasize in their work what interests them most, and are strongest along the lines of their enthusiasm and comparatively weak in other things. Landscape artists, as we have seen, often treat figures as mere incidents or like Hobbema, get other artists who are better at figures to put them into their landscapes. Claude, a famous French landscape artist, used to say that he sold his landscapes and gave away the figures.

Although France has produced many distinguished painters of animals, Rosa Bonheur is given first place by most critics. An American critic, S. G. W. Benjamin, in comparing her work with that of Troyon and Landseer, says there is the same intense observation and sympathy with nature, the same vigor of treatment, and that she has "more refinement than Troyon with rather less power, but more power than Landseer, so far as the representation of cattle is concerned."

The studio of the Bonheurs in the suburbs of Paris has been described as "a veritable Noah's ark with its menagerie of birds, hens, ducks, and sheep." Every day the two boys took the sheep from the apartment down the six flights of steps and to the plain of Monceau where they could pasture. Later when the family had a larger income, they moved to a beautiful residence in the fashionable part of the city and a place was hired for the animals in the suburbs.

When Rosa Bonheur began to paint, it was so unusual for a woman to do such things, that in visiting the slaughter houses of Paris where she could see cattle, she dressed in men's clothes and wore her hair short to protect herself from the ill-mannered curiosity of the workmen.

The Prophets, by Sargent

John Singer Sargent (American, 1856)

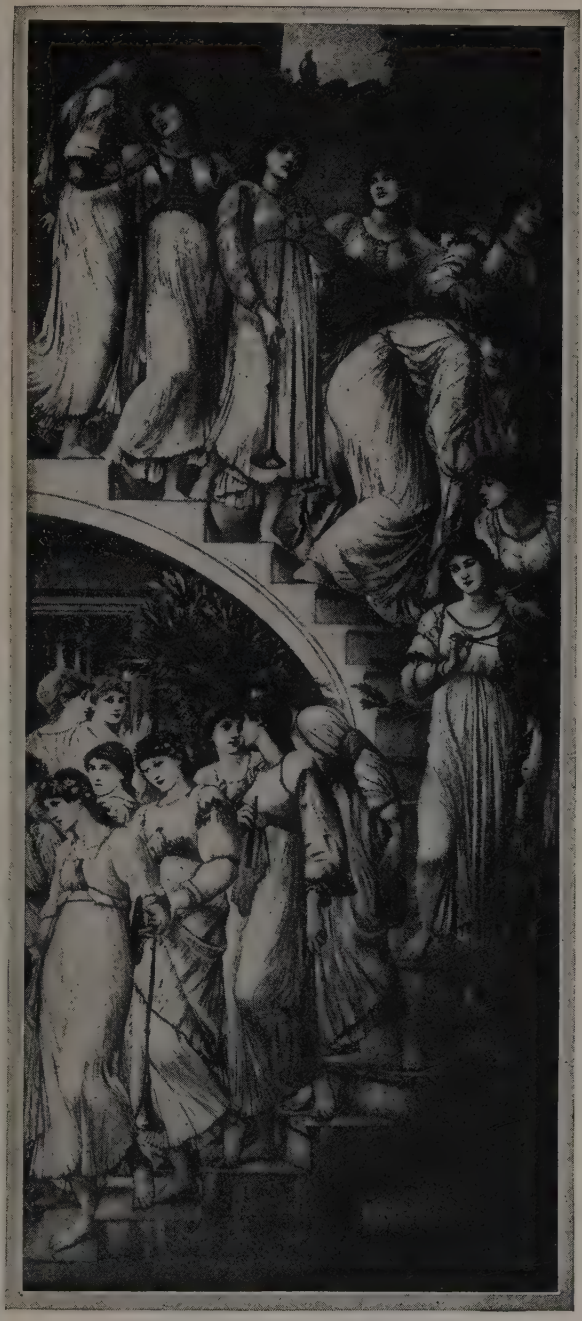
ALTHOUGH the art life of America is too short to have produced many artists, it has produced a few who rank among the very best, and Sargent is one of them.

Hercules Struggling with Death, by Leighton

Sir Frederick Leighton (English, 1830)

IT IS said that no one since the days of the Greeks themselves has succeeded in entering so thoroughly into the classic spirit as Sir Frederick Leighton. Most of his paintings—certainly the most famous ones—are scenes from Greek life and Greek myths. This picture represents Hercules struggling with Death for the possession of the body of Alcestis. Notice that there is nothing hideous about the face or figure of Death.

The Golden Stairs, by Burne-Jones



Edward Burne-Jones (English, 1833)

BURNE-JONES not only painted poetry as so many painters do, but he was a highly idealistic poet and painted scenes, not of this world but of a world of beauty of his own creation. Sidney Colvin, an eminent English critic says: "A flower painted by Burne-Jones is like a flower described by Keats; all the fragrance and color and purity are caught and concentrated in magic pencil strokes."

Many of his subjects, like the Golden Stairs, are purely decorative and for that reason particularly ideal in treatment. The drawing of the human form is wonderfully well done. The scene as a whole has an archaic effect, like the use of ancient forms of words by a writer. They seem to carry us into times and scenes when people lived lives far different from our own. This picture represents a winding procession descending a stairway—perhaps to some beautiful religious festival. The movement of the figures and the grace of the curving lines is like the grace and movement of a song.

Burne-Jones is classed among the Pre-Raphaelites, but free from the extravagances of that school of art. In 1881 he received from Oxford the honorary degree of D.C.L., and in 1885 was elected President of the Royal Birmingham Society of Artists and made an Associate of the Royal Academy of Arts, London. The latter he resigned in 1893 when he became one of the founders of the New Gallery, where, and at the Grosvenor Gallery, in the British metropolis, most of his pictures were first exhibited.

The Swimming Boys, by Sorolla

©Hispanic Society of America

Joaquin Sorolla y Bastida (Spanish, 1863)

THE work of Sorolla has been compared, for the strong suggestion of movement, to the work of one of the Italian Old Masters, Botticelli. Sorolla paints boys and girls as Botticelli paints his swift nymphs and the wind-gods. In both there is the joy of motion and the suggestion of the rush and tingle of the life of youth. These boys are as nimble as little frogs and as unconscious as the frogs that there is anything in life to feel sad about. There is no posing, there are no artificial attitudes in Sorolla. These boys are not swimming as some painter might imagine boys should swim in order to be most graceful, but they are kicking about with the impulse of the moment and the skill acquired by long practice. And even in this reproduction in black and white, you can realize that one of Sorolla's distinctions is his ability to reproduce on canvas the brilliant sunshine playing through the blue waters of the Mediterranean. Some one has said you can even taste the salt of the sea and feel its bracing winds when looking at Sorolla's canvases. Of course, to do this you must give your imagination full play.

Sorolla, beside being given high rank by the critics, is also very popular with people who have never made a study of art. This picture, as well as another called "The Bath" representing little girls splashing about in the water in brilliant sunshine, always attracts visitors at the Metropolitan Museum of Art in New York City, where the originals of both pictures are to be seen.

Like Murillo and Velasquez, a Spaniard by birth, Sorolla received his art education in his native town, Valencia, and in Paris and Rome. His first great success was "Another Margaret" which was awarded a gold medal in Madrid. His reputation grew rapidly and he was soon given the first rank among living Spanish painters. His "Fishermen's Return," first shown to the public at the Paris Salon, was purchased by the French government for the Museum of the Luxemburg.

In recognition of the merit of the works he showed at the Paris Exposition of 1900 he was made a Knight of the Legion of Honor, and in 1906 an officer of the Legion.

Works of Art in Stone

THE most wonderful things in the whole world of art, in many respects, are the poems in marble left us by the Greeks; for the Greek sculptor was a poet who expressed himself in stone just as Homer expressed himself in song. It used to be thought, not so very many years ago, that the Greeks excelled in art as they did in everything else we include under the word "culture," because they were so brilliant. It was assumed that the beautiful works which time has spared to us, such as the "Winged Victory" and the statue known as the "Venus de Milo," were fairly representative of all their work. No one thought of the Greeks as producing anything crude. But remains of earlier periods in the history of Greek sculpture show that the Greek owed his success to his patience and eagerness to learn and improve, and not to any mysterious quality of mind which would enable him to achieve such wonders off-hand. His best art developed slowly from crude beginnings.

The Greeks got their ideas of sculpture from the Egyptians through the Greek merchants of Asia Minor from whom they bought small reproductions of the native art. By comparing the head of the Egyptian king shown on this page with the best work of the Greeks, you may see not only how much Greek art advanced beyond the Egyptian, but also what excellent first lessons the Greek got from his study of the work of the Egyptian. This picture shows the head and shoulders of a full-length statue of Rameses II. He is supposed to have been the Pharaoh of the Hard Heart, of whom you have read in the story of Israel. The statue, which is carved in black granite, is in the museum at Turin in Italy and is regarded by many as the best product of Egyptian art.

Another interesting thing about it is the story of that block of stone on the Pharaoh's neck and extending down the back. The first attempts of the Egyptians to represent living forms in stone were simply outlines cut into the stone as you make a figure in sand with your finger. Next, they rounded the edges of the figures bounded by these lines. This not only made them look more natural but gave them the appearance of standing out from the stone and gave the artist the idea of cutting away entirely the stone between the figures. This, of course, made them stand out still more. Then, finally, step by step, and century after century, the idea grew so that the sculptors became bold enough to conceive the form of a figure in stone *almost* separate from a wall.

Almost, but not quite! As sculpture with the Egyptian had always been a part of a wall, it would not do (in the opinion of the conservative oriental) to make a statue—and above all, a statue of a king—without some reminder of the wall which had been a part of the images of all his ancestors. So the artists left that block on his royal back to represent the traditional wall.

It was because the Greeks, among other things, were not afraid to make changes and experiments in art that, although they got their first lessons from the Egyptians, they soon broke away from these old traditions and so achieved the perfect art represented by such works as we reproduce on the next two pages.

A God King of the Assyrians

THE work of the Assyrian sculptors is of interest, historically, but is not so important from an art standpoint as the work of the Egyptians. The Assyrian artist used Egyptian designs and symbols combined with those of Assyria. He got his idea of putting wings on animals from the Egyptians. He does, however, deserve credit for the skill with which he carved the figures of animals. These huge winged bull figures are very impressive. They adorned the front of the palace of the king and were supposed to represent his god-like ancestors. The extra leg is added to the figure so that no matter from what standpoint you are looking at it, you can see four legs.

The Hermes of Praxiteles

GREEK sculptors were the greatest the world has ever seen, and among all the sculptors Phidias and Praxiteles ranked first; so that you can imagine what a wonderful event it was in the art world when excavators working at Olympia, one day came upon this statue and found that it was the work of Praxiteles. It represents Hermes—or Mercury as the Romans called him—holding his little brother Dionysus (Roman Bacchus) on his arm. The whole statue shows a standing figure. Here we reproduce only the most striking part of it. Hermes was the most popular of all the Greek gods because, among other things, he was the ideal of youthful vigor and grace.

The Venus de Milo

THIS is probably the most famous statue in the world and is regarded as typifying Greek art at its best. It gets its name from the fact that it has so long been supposed to be a representation of Venus and that it was found on the Island of Melos. Scholars in recent years, however, have found reason to think that the statue is not Venus but Victory, and that it originally had a shield resting on the upraised knee which the goddess held with one hand while with the other she inscribed the names of Greek heroes. According to this theory the statue was originally in the Temple of Victory in Athens, but was carried away and buried on the Island of Melos to avoid being captured by some invading enemy. The Athenians had a proverb about a Victory without wings.

Examples of Roman Art

The Statue of Augustus Caesar

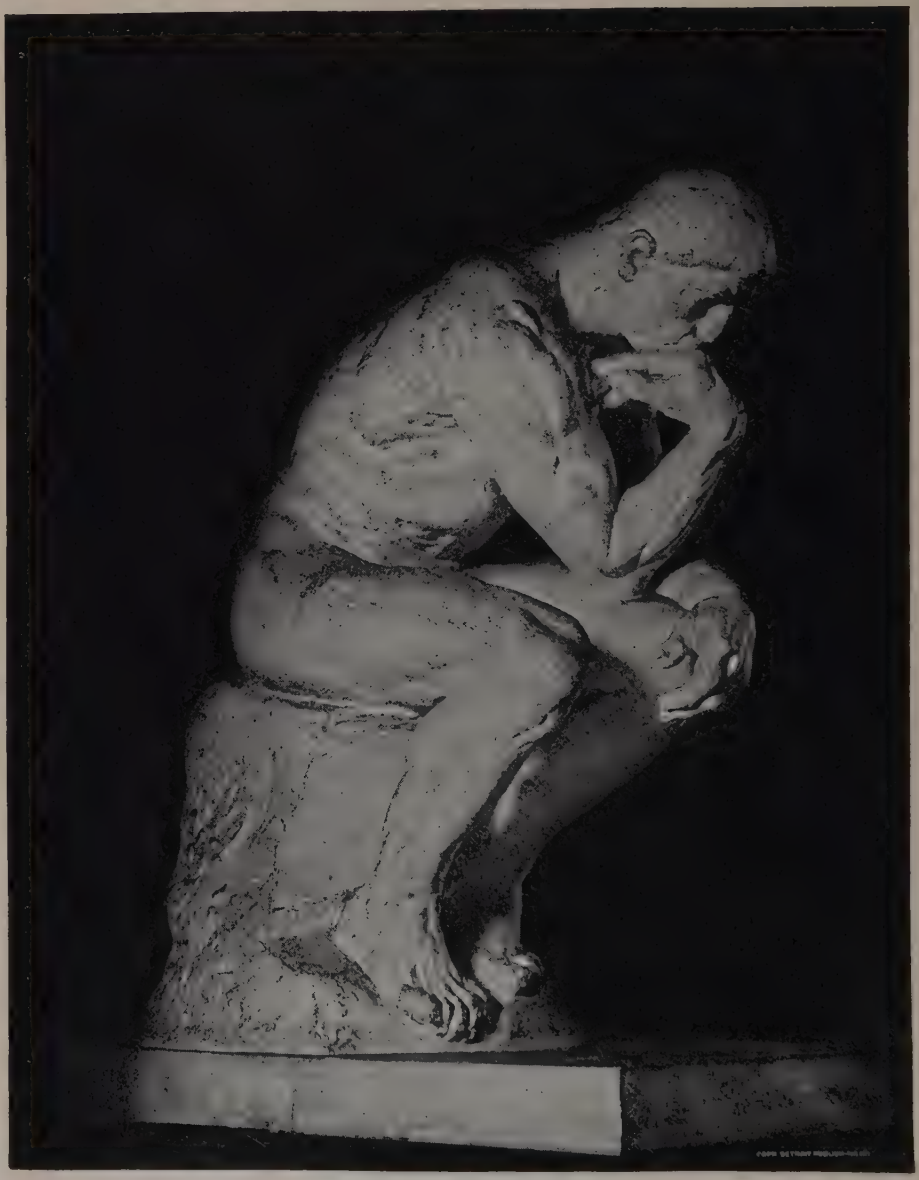
THE Romans never excelled in art as did the Greeks and such art as they produced was largely the work of Greek artists or the result of Greek influence. As the Romans worshiped force, we would naturally expect that the best work of the Romans would be shown in such figures as this of Augustus Cæsar.

The Dying Gaul

THE Dying Gaul is a very famous product of Roman art and if you should ever go to Rome you will have an excellent opportunity to compare it with the work of the Greeks, for the original is in the Capitoline Museum near the Faun of Praxiteles, a masterpiece of one of the greatest of the Greek sculptors.

Masterpieces of Modern Sculpture

The Thinker, by Rodin



Auguste Rodin (French, 1840)

THIS is the most famous of the works of the most famous sculptor of his time, Auguste Rodin. The figure is from a door designed by the artist for the Museum of Decorative Arts in Paris, and represents primitive man, gazing at his descendants, in Dante's Inferno. Rodin called Angelo his master and his idol, and you can see the strong influence of the great Italian upon the great Frenchman by comparing this figure with that of Angelo's statuesque conception of the Prophet Jeremiah, on a preceding page.

Joan Listening to the Voices, by Chapu

Henry Chapu (French, 1833)

THIS is a modern statue conceived in the simple and lofty Greek spirit which distinguished the work of Chapu; for Chapu was a deep student of Greek sculpture.

The full title is "Joan of Arc at Domremy." She is represented as kneeling, rapt, and with clasped hands as she listens to the voices calling her to her high mission.

The Stone Age

John J. Boyle (American, 1851)

BOYLE is an American sculptor of rare insight and power who has made a special study of the Indian in his most primitive state. This Indian mother has heard some sound that puts her on the defense. She has caught up one child in her arm and with her stone hatchet is preparing to do battle. Notice how the hatchet is fastened to the handle and then remember what is said about "The Grandfather of Grandfather's Ax" in the Story of the Copper Industry. This group stands in Fairmount Park, Philadelphia. Lorado Taft, the sculptor and art critic, says that the expression of power, monumental simplicity, and unity in this work, has not been surpassed.

Bust of a Child, by Canfield

ONE striking difference between Greek and Christian art is that while the beauty of children and childhood is so conspicuous a feature in Christian art, it is seldom represented in Greek art at all.

With the exception of the Figure of Cupid, which frequently appeared in the work of the Greeks, you seldom find the image of a child, and when you do, both the face and the figure are apt to be too mature. If you try to draw the face of a child, you will find that it is almost sure to look like the face of an adult, so that you can see this lack of skill on the part of the Greeks was due to lack of practice.

Birtley Canfield (American, 1866)

But what a sweet childish face the sculptor has given us here.

Perhaps the most famous child head in sculpture is that of Donatello's Laughing Boy. That little face is full of sunshine and you can hear the music of his merry laugh. A reproduction of it, which you can easily get in the penny picture series, would make a good comparison with this tender, serious face by Mr. Canfield. And a very delightful and profitable thing to do, in connection with your study of the beautiful language of art would be to make a collection of pictures of children and scenes of childhood as the artists have depicted them.

The Chariot Race, by Roth

F. G. Roth (American, 1872)

MY, what wild movement the artist has put into these figures! We can fairly hear the thunder of the horses' feet and feel the strain of the muscles of the charioteer. His horses are performing one of the most difficult feats in the chariot race, that of swinging around the turning posts where the charioteer goes back upon his course.

As the Greeks learned of the Egyptians, so you can see the Greek spirit is guiding the work of our American sculptors.

The Sphinx and the Pyramids

WE ARE indebted to the Egyptians for so much in the building up of this civilization of ours! Besides making a beginning in the arts and sciences, it is they who have built the hugest monuments man has ever erected. The Sphinx and the nearby pyramids are the largest, as well as the most perfect in workmanship, of any of the structures built to mark a spot made dear to men.

THE greatest of the Egyptian pyramids is at Gizeh, not far from the Sphinx. Enormous as the Sphinx is, this picture of it with the vastly larger pyramid in the background, makes it look quite diminutive. Most of the Sphinx' body is buried in the sand.

Inside One of the Great Pyramids

THE passages in the Great Pyramid were so cleverly hidden that it has taken seven thousand years to find them. The King's Chamber was supposed to have been built to protect the Pharaoh's bones and there was presumably a coffin within it. The ceiling, and that of the smaller room below, known as the Queen's Chamber, shows the germ of the arch. It is not a true arch because there is no keystone, but it has a series of stone blocks braced against each other and exerting a sidewise thrust as an arch does, thus distributing the weight of the masonry above. The entrance to the King's Chamber is near the base, at the right. Before reaching it, a long inclined gallery that looks in the picture like a "stone book," had to be traversed. The object of the well and grotto hollowed out of the natural rock is not known.

One of Cleopatra's Needles

BESIDES pyramids and sphinxes, the Egyptians built obelisks like this one, for monuments—tall, tapering shafts cut from one piece of stone and covered with hieroglyphics.

This one was given to the United States by the Egyptian government and now stands in Central Park, New York. Although built many years before the beautiful queen lived, this monument is called "Cleopatra's Needle."

The Great Washington Obelisk

THE Washington Monument, in Washington, D.C., is a modern obelisk, the largest one in the world. It is of white Maryland marble, 55 feet square at the base and 555 feet high. It was built in Washington's honor.

The Puritan, by Augustus Saint Gaudens

Augustus Saint Gaudens (American, 1848)

THIS statue of the stern old Puritan stands in Springfield, Mass., and bears upon its base, as you see, the name "Deacon Chapin." There was a Deacon Chapin but no portrait of him exists, so that the statue is merely an expression of character. Stern and unyielding as the granite rocks on his New England coast, the Deacon with his staff in one hand and his Bible under his arm, strides forward on his way to church. "Deacon Chapin" is regarded as the best expression of Puritanism in American art. While the Puritan was hard and uncompromising, it was his sterling character that helped much in shaping American history and laying the firm foundation of our institutions. "There was nothing in this wild land of privation and struggle to attract the vicious and weakling."

Sir Henry Vane, by MacMonnies

SIR HENRY VANE
GOVERNOR OF THE
COLONY OF THE MASSACHUSETTS BAY 1636
BORN 1612 BEHEADED 1662
A FEARLESS DEFENDER OF CIVIL LIBERTY AND
ADVOCATE OF FREE THOUGHT IN RELIGION
HE MAINTAINED THAT GOD'S AWARD AND LAW'S
ARE SUPERIOR TO THE KING
THIS STATUE WAS PLACED IN U.S. A. IN 1903 BY HIS
JAMES FREEMAN CLARKE DID AN HONORED CITIZEN
OF BOSTON WHO DEEPLY LABORED FOR THE ABOLITION
OF SLAVERY IN AMERICA

Frederick William MacMonnies (American, 1863)

MAC MONNIES became widely known to the general public through his colossal fountain at the Columbian Exposition. It contained twenty-seven gigantic figures, all beautifully modeled and so composed as to make the most striking effect. "Sir Henry Vane," the subject of this statue, was an English statesman who, after a wild life at Oxford, became a devout Puritan and emigrated to Massachusetts, as did the other Puritans, on account of his religion. He became governor of the colony in 1636. As a Puritan his character offers a striking contrast to the Puritan depicted by Saint Gaudens. One of his English contemporaries, the Earl of Clarendon, spoke of him as a man of "extraordinary parts, a pleasant wit, a great understanding, and a temper not to be moved." Does he look like that kind of a man?

Grant's Tomb on Riverside Drive

THIS famous monument to one of America's great men, offers many contrasts to the pyramid monuments of the Pharaohs. For one thing it was built with money supplied by over sixty-four thousand contributors in New York, where this monument stands on the beautiful Riverside Drive, while the tomb of the Pharaohs was built by people who were virtually slaves of their rulers.

The lower portion of the Grant Monument is of the Grecian Doric order. On this stands a circular cupola, 70 feet in diameter, of the Ionic order, surmounted by a pyramidical top as expressing the most ancient form of monuments.

The four corners of the interior, which is laid out in the form of a cross, are connected by arches and the space between the arches is decorated with figures in high relief, dealing with the military and civic career of General Grant.

The Stevenson Memorial, by Saint Gaudens

THE Stevenson Memorial by Saint Gaudens is the tribute of one great artist to another. Saint Gaudens was not a great reader, but when some friend got him to dip into "The New Arabian Nights," he says: "These stories set me aflame as have few things in literature. So when I subsequently found that Mr. Low knew Stevenson quite well, I told him that if Stevenson ever crossed to this side of the water, I should consider it an honor if he would allow me to make his portrait." It was only a few weeks after this that Stevenson came to America on his way to the Adirondacks for his health.

One of the things about Stevenson which appealed to the artist was the beauty of his long slender fingers. The fingers of Mrs. Saint Gaudens were long and slender, like those of Stevenson, and the artist tried to use them for a model but was not satisfied with the result. So he made a cast in clay from Stevenson's own hand. This will give you an idea of how carefully artists work to get their results and what trouble they often have, just as you do when you are trying to make a picture of something or to model it in clay.

When Stevenson posed, the position was at first forced and unnatural, so Saint Gaudens suggested that if he would try to write he would probably fall into a more natural attitude. He took up a sheet of paper, of which he always had a plentiful supply around his bed, pulled up his knees and began. The result was the position you see, which is exactly what the artist wanted. When Saint Gaudens had finished, he told Stevenson he need not write any more, but Stevenson kept on. When he had finished he folded the paper on which he was writing, put it in an envelope, addressed it, and handed it to the artist. On the back of it was the inscription, "To Master Homer Saint Gaudens." The artist's son, who was then a little boy, had been introduced to the famous author by his father, and Stevenson in the kindly impulsive way which was one of his most delightful characteristics, wrote the boy quite a long letter in which he said many nice things about him. The letter, in accordance with Stevenson's directions, was given to the boy years later. You may imagine how he treasures it.

This memorial of a heroic and beautiful life is singularly appropriate because Stevenson was an invalid and did a great deal of his work in bed, as he is represented as doing here.

The Meaning of Art and Architecture

I THINK we all realize now, and better than ever before, when so many of the great masterpieces of architecture have been destroyed almost in our sight, how much more they stand for than the excellence of individuals or peoples in this very wonderful form of art. You cannot think of Rheims Cathedral or the Cloth House at Ypres or the Town Hall of Arras as nothing more than the masterpieces of great artists or as the curious and interesting records of almost forgotten times. They are far more than this, and so are all the other great buildings that time and man have spared from amongst the myriads that once made towns and cities such beautiful places to live in; they are records indeed, but records of the best that was in any community; the best in thought, in aspiration, in honest and joyful labor.

Man is the animal that tries and he is always striving for something better—or at best this is so most of the time and while he is living as he was intended to live when he was created. Also, he is always impelled to express this "best" through beauty in one or many of its varied forms, for the sense of beauty was given us just that we might say through it, symbolically, those things that are so very high and fine that they cannot be expressed in words. The saying of those high things beautifully is what we mean by Art.

Now, ever since the beginning of history, the high and fine things have always meant a definite and sincere religion, and so all the greatest art of the world has been closely connected with worship. It does not matter whether you consider architecture, sculpture, painting, music or any other of the arts—all have come in the beginning from the religious sense and the healthy hunger for worship. You realize this in architecture through the fact that practically all the examples that remain to us are either temples or churches, until you come down to comparatively modern times.

Now this is not only significant of what art means and of what it must have again if it is ever to reach once more the level of the great art of the past, but it also shows us what we can learn from the old architecture if we look at it in the right way. In these wonderful buildings, whether they are Greek, Roman, Byzantine, Gothic, Renaissance or even Asiatic, we can see the best of the several peoples expressing itself through the master builders, craftsmen, and artisans who are only the mouthpieces of the communities of which they are a part.

Architecture—and this is true of all the arts—is a great and very reliable teacher of history, for it reveals, not more or less accidental events, but the best in the peoples that made it.

Ralph Adams Cram

Story of the Builders

How Huts and Caves Grew into Cathedrals, Palaces, and Homes

St. Peter's and the Eskimo Hut

"The snow hut of the Eskimo is a rude burrow. But in form it is the same as the lifted domes of St. Peter's in Rome and St. Paul's in London."

NEARLY everybody thinks he knows just what he would do if he were a castaway like Robinson Crusoe. Trust him for finding food, starting a fire and building a good shelter! But just *how* he would do these things would depend upon where he found himself. What materials and tools he had, and how well he could use them.

Did you ever think that a man who was cut off from other men, and from all that people have learned to make and use, would be like the tree and cave-dwellers of thousands of years ago? He would have to conquer nature all over again in order to provide for his simplest wants. At first he would have to eat his food raw, and sleep in a cave or a tree-hammock. He could make a tent of poles and the skins of wild animals—but he would first have to catch the animals. In a tropical land he would find long grasses, bamboos and palm

leaves for building a tent, but he would need a tool for cutting them. In a forest there would be poles and bark; in a rocky land, field stones, mud and moss; on semi-desert plains, clay for brick making; in Eskimo land animal bones and snow.

Did You Know There Are Cave Men Today?

Caves and tents and huts were the earliest homes made by men, and people are still living in just such shelters. None of them were easy to make. The cave-dwellers had only sticks to dig with, or clumsy stone and bronze tools, and clay vessels for carrying out the earth. Yet they dug whole villages of caves — these cave-dwellers. They scooped rooms out of the stiffest clay, between ledges of rock, one street of cells above another, high up on the faces of the cliffs. They had to do this to be safe from enemies and from wild animals.

Whole Villages of Caves

The mound builders of the Mississippi Valley dug pits and roofed them over with sod. Then they heaped up earth walls around villages. They lived in earthwork forts. Armies throw up such ridges today. Soldiers and campers copy, in canvas, the skin-covered tepee of the Indian, and circuses the tent house of the herder on the Arabian desert. The Gypsy has put his tent on wheels. People who had to move about to hunt and fish, or to find pasture for animals, used the tent. It could be taken to pieces and carried from place toplace.

Where people could live safely, and find enough to eat without moving about, they built huts, improving on their old caves and tents. Men improve, and borrow and imitate, but they do not invent something entirely new. In any art or science they take one step at a time, although, when they travel and see other ways of doing things, they take longer steps at a time.

How Men Invent

The cave-dweller learned to use a hearth stone, under cover, and to cut a smoke hole. Used to working in clay, when he came out of his cave, the Pueblo or village Indian made his hut of sun-dried bricks. A tribe put all their huts together in one cliff-like building. Perhaps they still needed a fortress. But wise men think they didn't know any other way to build.

The First Brick Makers

The Man Who Lived in the Tree

In tropical countries tree-dwellers made hammocks of vine stems woven with grasses. Very likely they sat under these for protection from the sun. Then they raised canopies on poles. It was only one step more to weave walls. The roof was thatched with leaves to shed rain. The grass huts that are still made in many tropical countries are very clever samples of basket work. Stiff ribs are set firmly in the ground in a circle, drawn together at the top and woven with tough grasses. Every island in the West Indies, in the South Pacific, and every district in tropical Africa, had its own way of building. The most abundant materials were used, in the easiest ways at first, then in the best ways. Some of these grass huts are well built, and last for years.

People Who Live in Grass Houses

Even the Eskimo improved his snow cave. Uprooted trees in far away, warmer countries, fell into rivers, were carried out to the ocean and drifted to Arctic shores. The Eskimo did not know what trees were but he used these trunks, and later, timbers from wrecked ships, as

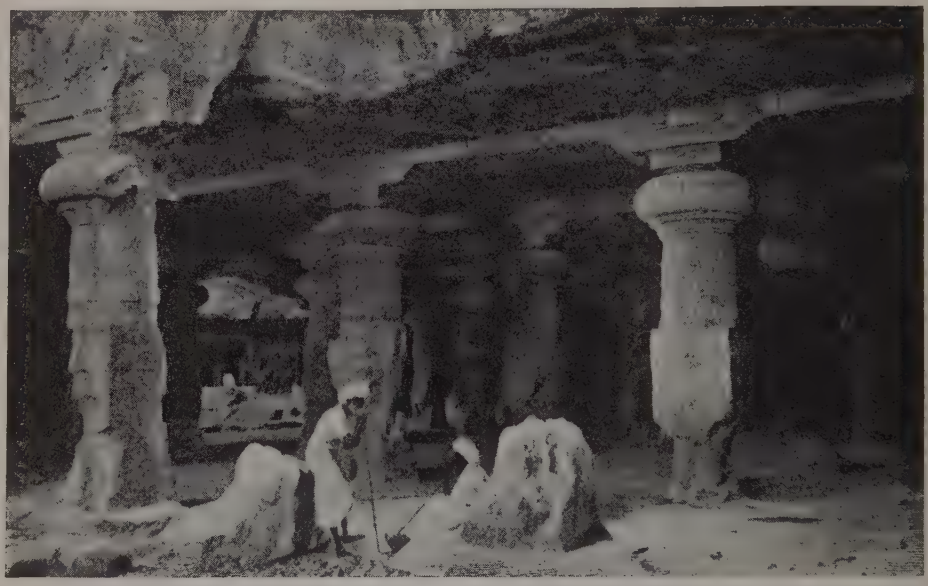
Improving the Snow Hut

The Cliff-Dwellers in Their Homes

The cliff houses, of which there are extensive remains in many of the western states, must have looked like this in the days when their Indian builders lived in them. The immense rock chambers for the storage of food, which they contain, and the difficulty of getting into them, must have made them a very sure protection against enemies, because the whole tribe could remain for weeks in this stronghold which would be very hard to capture, indeed.

a framework for his snow hut. In time, if he can get enough timbers for building, he may not use snow at all, except as a winter blanket. He has got tools and guns and sledges, clothing and furniture from house but he had a good ax, a saw, an auger, a hammer and other tools. If he was of English family he built his houses of logs laid horizontally, notched and crossed at the corners. A French pioneer in Canada, and

A Very Old Underground Temple



The early Christians in Rome built underground churches or catacombs, because the persecution of the government made it necessary for them to hold their services in secret. But ages before Christianity came into the world, people had formed the habit of worshiping underground. The reason for this is that the earliest forms of religion were connected with the burial of the dead, and worship was carried on in the place where the tombs were. The picture shows the ruins of a beautiful and richly decorated temple on the island of Elephanta, near Bombay.

Arctic explorers, and he lives much more comfortably than he did a hundred years ago.

The Two-Legged "Bees" of Northern Europe

In Northern Europe men made bee-hive shaped huts of field stones chinked with moss. Some used poles and branches woven with willow-twigs, plastered with clay and thatched with grasses. No doubt they learned to use bark. The Iroquois Indians made long bark houses. Timber houses could not be made until there were stone and bronze axes. The American pioneer made a log

French and English Log Houses

along the Mississippi made a post house. He set his tree trunks upright in a trench. But both of them chinked the cracks with clay and moss until they could burn lime and make mortar. The block-house fort was made with logs laid horizontally; but the enclosing wall was a stockade of posts.

The People Who Lived in Lakes

The settler in America did not invent these ways of building. Not so many hundreds of years before, in the wooded countries of western Europe, people had built huts and defensive walls of timber. In Scotland

How Lake Houses Were Built

and in Switzerland, in the ages of stone and bronze tools, wild tribes built tree-trunk villages in shallow lakes, to be safe from enemies or from animals. Piles were cut and driven in the mud, or they were mortised in beds of logs, or braced with stones to form piers. On top of these piles platforms were laid and timber houses built. A bridge was built to the shore, or dugout boats were used. Sometimes people were driven out of their lake dwellings by rising waters. But certainly they came to dry land to live as soon as they could.

How do you suppose they built homes then? Why, with timbers. They were timber workers, and all over western Europe today — in Nuremburg, Germany, in Edinburgh, Scotland, in Swiss mountain hamlets, and in English villages, you can find beautiful specimens of timbered houses made centuries ago. When the forests became thin they had to use timbers only for the framework, and to fill in panels with brick and stone, which they usually plastered. We copy this half-timbered, stucco house today.

Beautiful Timber Homes

An African Village

"Every district in tropical Africa had its own way of building. The most abundant materials were used in the easiest ways at first, then in the best ways." The natives who built these huts have learned to build the walls of mud and stones, though they still make roofs of grass and leaves.

Why Solomon Sent to Tyre

In every country men worked best in native materials. In one place the carpenter was the best workman, in another the brick-maker and layer; in another the stone-cutter. When the Israelites were slaves in Egypt

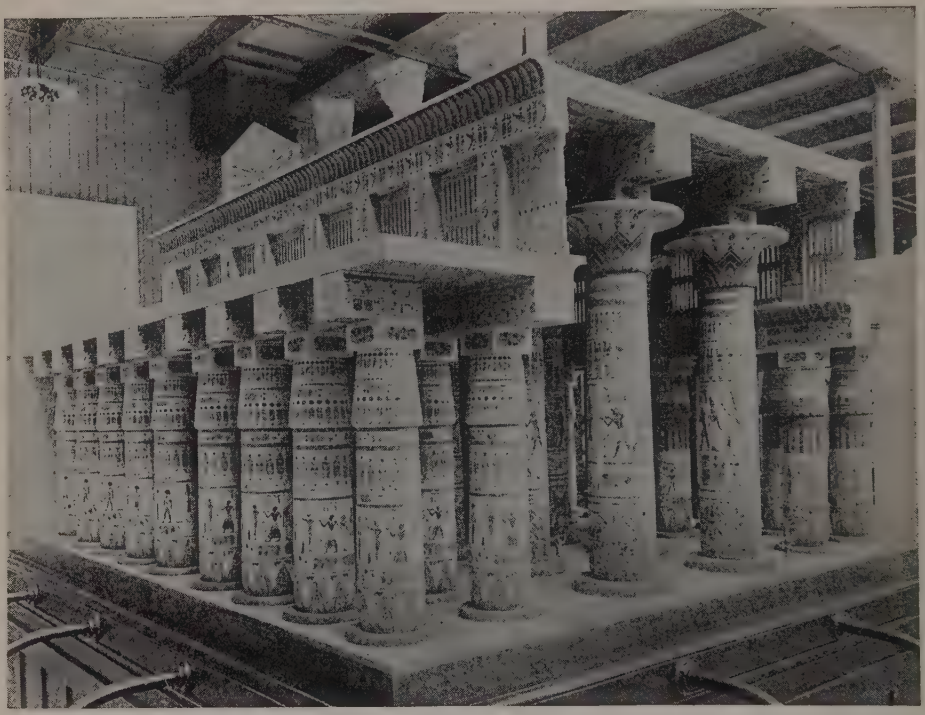
How London Probably Loo

Isn't it strange that this prehistoric village, the remains of which were found near Glastonbury. I this ancient village, you would see the docks as the heart of the city and the water traffic as the basis of i such houses. On the extreme left you see the beginning of the ship-building and ship-repair yards of the is a slave putting clay in baskets ready to carry into the village, where it will be made into the crude potte of a hunting expedition. The men on the left have brought in swans which were then used for food. T are known to have used slings, because thousands of "sling-stones" made of clay balls have been unearthe

n the Days of the Ancient Britons

much like the great London of today? Looking at a bird's-eye view of London today and comparing it with life. London was in fact probably such a village as this at the time when the ancestors of the English lived in y. These men are digging out a boat. On the right of these are fishermen hauling in their nets. Near them in housekeeping of that day. In the center is the chief accompanied by two attendants welcoming the return armed with iron-headed and stone-headed spears. They are supposed also to have used bows and arrows. They

How the Egyptian Temples Looked



This is a model or pattern of an Egyptian Temple. The Egyptians, you know, were the first to build really beautiful buildings. They used the column, as you see. In fact, their temples were composed almost entirely of columns. Can you tell how these columns are different from those built by the Greeks? Notice how small the human figures look beside them. The comparison gives you an idea of what tremendous pieces of architecture these temples were.

they learned to make bricks. Long after they were free they had not learned to shape timbers and fit them together. When King Solomon built his temple he had to send to Tyre, a ship-building city, for woodworkers.

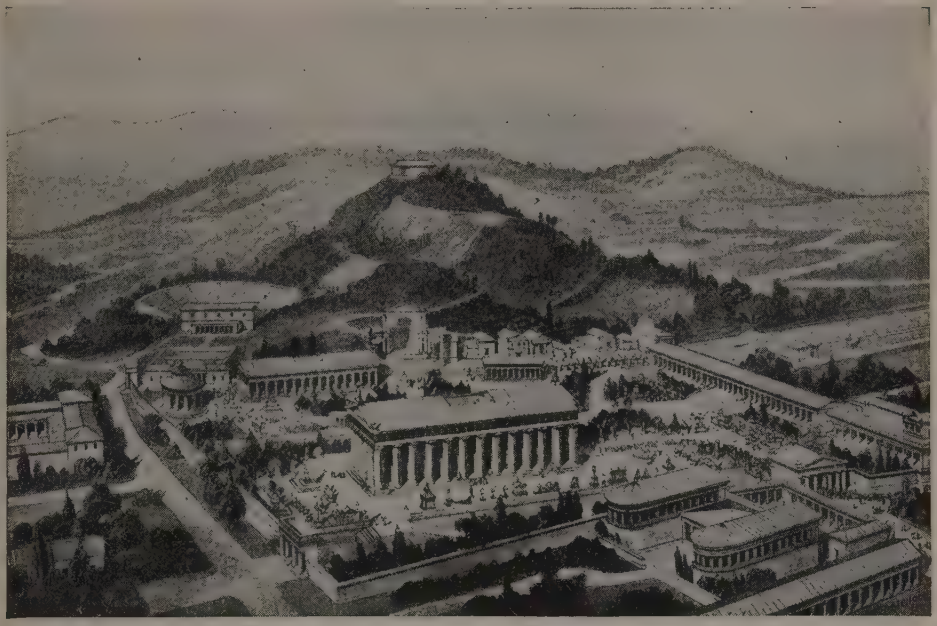
Many Kinds of Building Material

Egypt, a desert country, burned brick, and dressed stone. Greece worked first in wood, then in marble. Rome used brick, stone and cement. Marble, which had to be brought from Greece, was used in thin sheets as a veneer. Arabia made sun-dried bricks. China, having many kinds of fine clays, made bricks, tile and porcelains. In Iceland, Lapland and other cold, treeless countries, people have never been able to make anything better than low, cave-like huts of mud and moss and sod.

"Tents" Fifty Stories High!

Our houses of today are just improved caves, tents and huts. You can find the tent form in pictures of the little houses in the islands of the East Indies. They were built by Chinamen. All over China, Japan, Korea, and Siam you will find the tent roof. It has curly edges, pushed up corners, sagging sides, as if it were a skin canopy held up by poles. At one time most of the people of the Far East were herders on the wild steppes of Central Asia. Even today the Chinese build the roof of

The Playground of the Ancient Greeks



Olympia, the ancient Greek city where the Olympic games were held, must have looked like this. All the buildings illustrate the Greek type of architecture—a sloping roof supported by rows of stately, graceful columns. The large building in the center is the temple of Zeus, which contained the huge statue of Zeus that was one of the seven wonders of the world. (Read the story about it.) The long building at the extreme right is the entrance to the stadium where the races and other athletic contests were held.

a house first, on scaffolding. Then they run the walls up to the roof.

Putting the Roof on First

The Japanese, too, build heavy roofs of tiles on corner piers, but their walls are thin, as if merely the curtains of a tent. The most beautiful oriental palaces, temples and pagodas, of glazed bricks and tiles and painted porcelains, have this tent-like form.

The First Great Step

The houses of Europe and America grew from the hut, and it was a big step when the hut was squared. A square hut has corner posts, cross beams, a ridge pole and eaves. Very slowly the square hut became a comfortable house. A floor of rush mats, of split-bamboos, of split-logs or of flat stones was laid; a doorway was cut and fitted with a door; a window opening was covered with lattice, beaten skin, thin sheets of pearl shell, or with glass.

Where Santa Claus Comes Down

In cold countries a bleak hut was turned into a warm cabin by a chimney so built that a fire on the hearth warmed the room and cooked food while the smoke went out of doors.

In America, although it was a wild country, we did not have to wait until we could re-discover how to dress timbers, burn brick and lime, cut stone and make nails and glass before we could copy the houses of the old world. Workmen skilled in the trades came over in the Mayflower, bringing their tools, and ships went back and forth. Our fur and wheat, tobacco and cotton were traded for manufac-

Foreign Houses on Our Streets

Building a Pioneer's House

tured goods. We soon copied the Dutch house of brick; the English cottage of timber and plaster; the church with its spire or tower, and its pointed windows; the pillared portico of the Greeks, in our public buildings and mansions.

No people in the world ever had such a chance to build well, in all materials, and in any way we pleased, as we. That seems to have been just the trouble. We had too much of everything, and we were growing fast, spreading over a wide country and were in a hurry. A man lived in Boston, his son in Cincinnati, his grandson in San Francisco. Anyone was likely to move the year after next.

In the days when this big country of ours was a vast wilderness with no factories or railroads or cities, settlers built log cabins with dirt floors. At the top a pioneer boy is tamping the ground with a heavy post to make one of these floors. It will be as firm and hard as cement. He is glad to have a share in the building of the new home. See how happy he looks. In the lower picture two boys are helping their father pile log on log for the walls of the cabin. Notice how they are raising the log to its place by rolling it up the incline made by two smaller logs.

And oh, we were "terribly" clever. (It's not good to be too clever.) The sawmill cut up our trees into clapboards and shingles. The paint brush covered cheap and hasty work, the scroll saw was made to do the slow work of the stone cutter's chisel. Clapboard palaces were trimmed with wooden lace. Yes, it was just as bad as that! The best thing about such houses was that they wore out quickly.

Cheap Houses that Didn't Wear

Then the forests began to disappear. It's an ill wind that blows no good. We were obliged to build better, in brick, stone, tiles, stucco, cement and steel. No people ever built their best until they began to work in lasting materials. It did not seem worth while. There are several reasons why we ought to build better than any people ever built before. Perhaps we shall. Perhaps you may help do it.

For one thing railroad and steamship lines now bind all the peoples of the earth together with links of trade and travel. You know what Puck says, in The Midsummer Night's Dream: "I will put a belt about the earth in forty minutes." The cable and wireless telegraph is doing that. We can have anything movable brought to us so easily. If we stay at home we can travel, in books and pictures and museums.

A Puritan Dwelling in Salem, Massachusetts

It is in New England that we find the greatest number of this kind of houses. Prim, without ornament or decoration, a little stern—they express the characters of the uncompromising Puritans who first built them. Compare this one, known as the Orne-Ropes house, with Mount Vernon. The doorway with its meager porch has a different aspect from that of the hospitable, pillared verandas of the colonial style.

Gothic and Greek Styles in Architecture

Where These Types Are Seen

Trade and travel always give people new ideas. People always try to imitate anything new that they admire. But no one can copy anyone else exactly. It is himself he puts into everything he makes. The

A Poem in Marble and Fresco

©Keystone View Co.

This is a view of the Congressional Library at Washington. The architecture here is another blend of many styles. The capitals are Greek (Can you tell which of the three great Greek styles they are?) and the arches, balconies and vaulted ceilings are typical of later periods. Some one has called it "a poem in marble and frescoed walls."

western world likes the Greek and the Gothic styles of building. The Greek style has a flat or slightly sloped roof, straight lines and columns. The Gothic is marked by its round or pointed arches. It runs up to towers, domes and spires and blossoms with dormers, chimneys and gables. Both styles are beautiful and may be carried out in great variety. We use the Gothic style chiefly for churches, the Greek for business and public buildings and for homes. The Italian villa omits the pillars. The Southern mansion, known as the Colonial style, is modeled on the Greek temple. We are now building a good many Italian-Greek houses in tile and stucco, but the Colonial house is more truly American.

"On the Front Porch"

We have a changeable climate—hot summers and cold winters. We

Mount Vernon on the Potomac

Washington's home, Mount Vernon, was one of the earliest and best examples of colonial architecture which we now honor as the most truly American style.

need a porch for a sun parlor and rain shelter. The Puritans built a porch across the entrance door, the Dutch a "stoop" or roofed steps. In the French Colonial house the roof sloped out over an open gallery. But it was in Virginia that the white pillars were run up to the roof. Trees were plentiful so the planters used them, as the Greeks once used them, to support the roofs of their open-air temples. But we rounded and fluted our tree trunks, spread the bases, carved the leaf capitals and painted the columns white in imitation of later Greek marbles. Still, the Colonial house was a home, not a temple. It expressed the spirit of the man who lived in it. It is the kind of home in which we like to think that Washington, Jefferson, Jackson and Lee lived. The White House is in this style. It is a President's mansion, not a King's palace. So now the Colonial has become a historic, American style. And the longer we live in it the more at home we feel in it.

Different Kinds of Front Porches

Busy Men Who Live in Steel Bridges

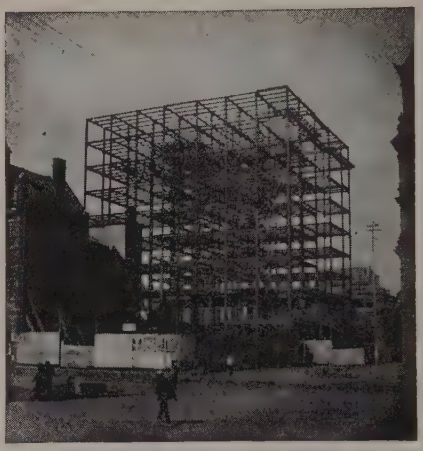
Another American building is the skyscraper. In a way it is not an invention. We simply set an iron or steel bridge on end, and close the sides with brick or stone. In form it is the old cliff-dwelling, one row of cells above another. The earliest ones had no style. They were simply packing cases with holes cut in them for windows. But, even so, they expressed the American spirit. They expressed our energy, self-confidence and ambition; our ability to conquer difficulties of every toil. The first skyscrapers were ugly because we did not realize that they could be anything but useful. Now we understand that they are really towers and, of course, beautiful

What a "Skyscraper" Really Is

A Skyscraper's Skeleton

towers have been built. It was a Chicago architect who said, when he designed the Woman's Temple: "I will lead the eye up to a roof that will go singing to the stars."

Now a Greek building should be low. It should keep the eye on a restful level. A Gothic building leads the eye upward. The most beautiful bell tower in the world is Giotto's, or the Shepherd Tower in Florence, Italy, and that is Gothic. Here is a hint



"In a way the skyscraper is not an invention. We simply set an iron or steel bridge on end and close the sides with brick or stone. In form it is the old cliff-dwelling, one row of cells above another—simply a packing case with holes cut in it for windows."

Eskimo is a rude burrow, the Kaffir's hut an overturned basket. In neither of them could a man stand erect, or look up to anything above himself. But in form they are the same as the lifted domes of St. Peter's in Rome and St. Paul's in London. And thoseare arches springing to the sky and turning the thoughts of men up to heaven.

Buildings that Do and Buildings that Tell

Ruskin says there are just two kinds of buildings—those that do and those that tell. A warehouse is good if it protects from the weather. But

What a Cathedral Says

a cathedral should tell, in height, and strength and grace, in painted wall and golden dome and stone tracery, all that men have dreamed and striven,

A New York Skyline

A view of a modern city looks very different from that of Olympia, the city of the ancient Greeks, doesn't it? The Greek buildings with their column walls, would not be suitable in our climate and they would take up too much space in a crowded American city. The modern tall building better suits our needs, and furthermore, we are learning to build skyscrapers that are beautiful as well as useful.

for builders of skyscrapers. Which of you is going to build skyscrapers when you grow up?

St. Peter's, St. Paul's and the Eskimo Hut

You see, there is more in a building than the materials and workmanship and form. The snow hut of the

A City Apartment House

The apartment house is a space-saving device—a row of residences, the rows being perpendicular instead of horizontal. We have copied this, also, from the cliff-dwellers. The picture shows a fine, new, eleven-storied apartment house in New York City.

The Entrance to the Apartments

Money and skill are not spared in producing the desired artistic effect in modern apartment buildings. Like the skyscraper, they are a development of modern civilization and have brought into being a new style of architecture.

The New Architecture

The picture shows a good example of a modern American home. It is a composite of many past styles of architecture, softened and blended so that they make a harmonious whole. Here are the different elements to be seen in it: Spanish Mooresque, Algierian Mooresque, California Mission, East Indian, Chinese ornament, modern invention and Anglo-Saxon home atmosphere.

What a Home Should Say

that was good and beautiful and true. A home should both do and tell. It should be comfortable to live in, but it should also express the spirit of the people who live in it. One should find in it what one finds in a poem that speaks to the heart, a painting, a statue, a song. Each man's chimney should be as Longfellow says: "A Golden Milestone from which he measures every distance," not only outward into the world, but upward in all the ways of sweet living.

The Work of the Little Builders

THIS is a castle of the Middle Ages. It was built by third grade children in Franklin, Indiana, in connection with their history work. You can see that it not only taught them a great deal about architecture, but made History seem very real.

The Medieval Castle, Constructed by the Children in Franklin, Indiana

In one corner of a sand table, stones were piled to form a hill upon which to build the castle. A board, 15 x 17 inches formed the foundation. With a compass four circles, each three inches in diameter were drawn, one in each corner of the board to outline the towers. These were connected with two parallel lines one inch apart, for the castle walls.

The clay, which had been soaked in warm water over night, was kneaded by the pupils until all lumps were removed, and it was of the consistency of dough. Then began the real work of building. The children worked at a bench rolling the clay out like biscuit dough, leaving it about one inch thick. Then with a knife they cut this sheet of clay into strips one inch wide and of the desired length. These strips were then placed on the board following the outline. It was built layer by layer, pressing each together firmly with the hands. A strip of pasteboard one inch wide was used as an arch foundation for the doorway. The smaller towers on either side of the doorway were built of solid pieces of clay.

When the walls were nine inches high a piece of stiff paper was laid over the top to form a roof, and then three inches more was added to this height, forming the battlement. The towers were built of different heights. When completed the clay was marked off with a sharp stick to resemble stone.

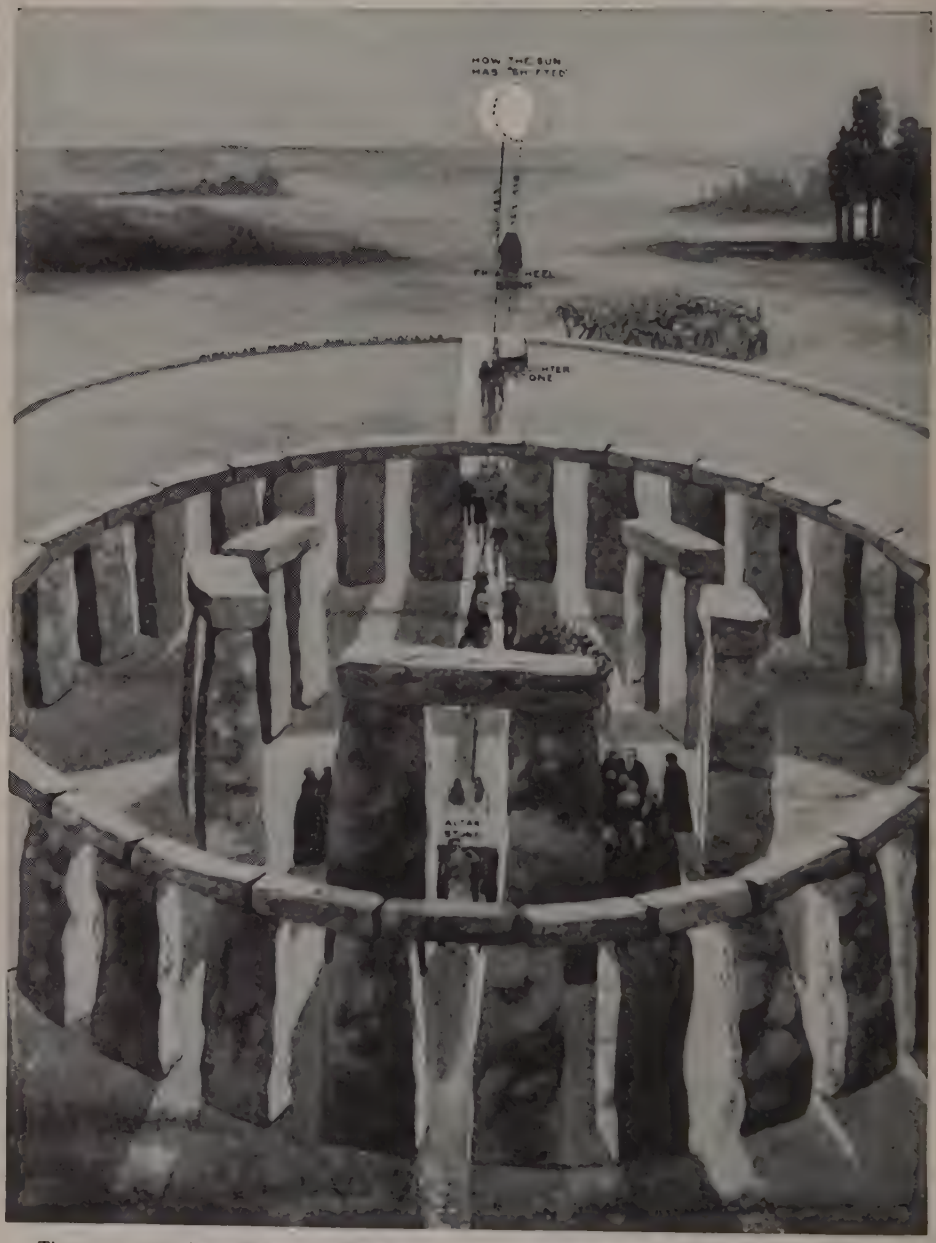
After the castle had stood a day or two and the clay had dried out somewhat, the windows were cut with a knife. The gratings in the windows and doors were made with window slats.

The wall around the castle was made of clay blocks. It is six inches high with a battlement at the top.

A moat was made around the wall by digging a trench in the sand, and placing tin foil at the bottom with a glass over it to resemble water.

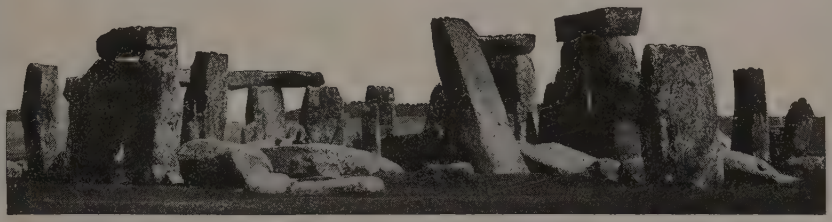
A wooden drawbridge was suspended by a chain to be let down across the moat.

Stonehenge in the Days of the Druids



There are several theories explaining the ruins at Stonehenge, but the most generally accepted one is that they are the remains of a temple built for sun worship. These ruins are a fine example of primitive architecture, built entirely on the lintel principle—that is, a series of columns capped by crosspieces. When the temple at Stonehenge was built, the midsummer sun rose on a direct line with the center of the horseshoe, the slaughter stone and the friar's heel stone. But because the earth's axis is constantly shifting a little, the sun now rises a few degrees to the right of this line. By calculating the angle the sun's rays now make with the line in which the three stones used to lie, and by figuring the rate at which the earth changes its axis, astronomers can tell us when this old temple was built—about 1680 B. C.

Great Works of Architecture



Stonehenge as It Looks Today

THE story of the Builders tells how men first built their homes. When a chief died, the tribe wanted to mark his grave in some distinctive way, to pay him a last tribute of homage and respect. From the earliest times we find the burial of the dead associated with religion. So our savage forefathers built monuments to their dead which were also temples for the worship of their gods. In the beginning these structures were nothing but heaps of stones. Later there were some crude attempts to shape the stones and they were piled upon each other in a more orderly fashion.

Like Giant Fingers

The Stonehenge temple originally consisted of a circle 100 feet in diameter, made up of thirty lintel-capped stones. Inside this, five trilithons—archways made up of two upright stones and a crosspiece, three stones in all—were arranged in the form of a horseshoe. These stones were all carefully fitted by means of mortise and tenon joints. (You can learn how these joints are made from the article on Manual Training.) It is thought that the trilithons were symbolic of the position of the five fingers in taking an oath, for the early Britons always took an oath by raising the hand with the fingers close together. The middle finger, longer than the rest, is represented by the central trilithon, 22 feet 6 inches high; the next one on the left corresponding to the ring finger was 22 feet, and the one on the right—the index finger—was 18 feet. The two end trilithons were each 16 feet high. It is thought that the sacrifice was prepared on the slaughter stone outside the circle and offered up on the altar stone.

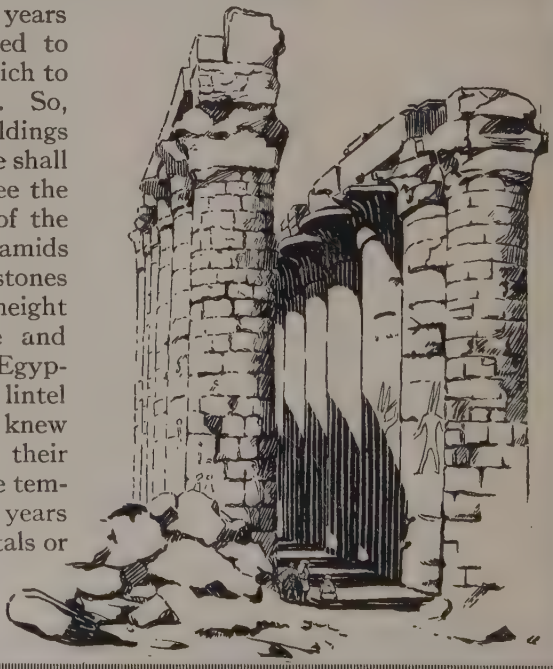
The ruins at Stonehenge, England, show that the early Britons had reached this stage. As they had no strong, sharp cutting instruments, they could only hew big blocks of stone roughly into the shapes they wanted. They stood these blocks on end and set other blocks across the top, making rows of rude pillars. But in doing this they had learned the first principle of architecture, that of the *lintel*. A lintel is a crosspiece or beam resting on upright supports. It was not until man had traveled for many centuries up the steep, hard road of civilization that he learned to build in any other way.

The Temple at Karnak

The Egyptians were the first great builders. They made huge columns such as these, with lotus-bud capitals. The drawing below shows another style of Egyptian capital, shaped like an open lotus flower.

What We Owe to the Egyptians

The Egyptians are a very old people, and thousands of years before the Britons they learned to make beautiful structures in which to worship and bury their dead. So, in order to understand the buildings in this modern world of ours, we shall have to journey to Egypt to see the great pyramids and the ruins of the Egyptian temples. These pyramids are the primitive man's pile of stones heaped up to an enormous height and planned with much care and knowledge of geometry. The Egyptian temples were built on the lintel principle, but the Egyptians knew how to round and carve their supports to form columns. The temple at Karnak was begun 2,000 years before Christ. Notice the capitals or crowns of the columns. Don't they remind you of a flower bud? They are carved stone copies of the lotus flowers that grow in the Nile valley. Later the Egyp-



Another Kind of Pillar

The great pillars at Karnak are a little too heavy and massive to be graceful. Compare them with these supports of the porch of the Erechtheum on the Acropolis at Athens—slender girls, strong enough to bear the heavy weight of the roof, yet gracefully poised. They are typically Greek figures, stately, strong, well-arranged draperies falling in graceful folds.

tians finished their columns with full-blown lotus flower capitals—an upturned, bell-shaped design. Study these long rows of massive columns. They are too solid and heavy to be graceful, but how stately and proud they look! The Egyptians, like all Orientals, considered impassive repose the highest attribute of deity and this, you see, they expressed in these haughty, impassive pillars. The largest were 70 feet high and nearly 12 feet in diameter.

Then Came the Wonderful Greeks

Partly borrowing from the Egyptians and partly working out their own ideas, the Greeks were the next people to add to the world's knowledge of how to build. They were an industrious, quick-witted people, artistic to their finger-tips. They lived on a little peninsula in the Mediterranean with many island stepping-stones to Egypt and the East. And because the Greeks did a good deal of visiting and trading with their neighbors, they soon learned all that those older countries could teach them

The Lion Gate

This is the lion gate at Mycenæ. It shows the first step in the development of the keystone arch.

How the Parthenon Looks Today

The Parthenon, as you know, was built long ago as a temple to Athena. Later it was used by the Christians as a church. In the fifteenth century, when Greece was conquered by the Turks, it became a Turkish mosque. At one time the Turks had some powder stored there which exploded, making the building the ruin you see in the picture. Lord Elgin, an Englishman, gained permission to collect as many of the beautiful sculptures as he could, and they are now to be seen in the British Museum, where they are called the Elgin Marbles. Could you tell that the lines of the building really slant though they look straight?

and set about adding to and improving what they had learned. Then, too, they had a lovely land of blue sky, forested mountains and sparkling rivers to inspire them to beautiful thoughts; and they had quantities of glistening white marble for working out those thoughts in permanent form.

The Three Greek Orders

Doric Ionic Corinthian

The Greek architecture family had only three children in it, all quite different from each other. They are called orders and the distinguishing feature of each is its style of capital. The earliest was the simple Doric with no decoration but its own good lines. The second to grow up was the Ionic, which, as you see, has a graceful bolster roll for the roof to rest upon. Decorating this roll is the egg and dart design and, in the true Ionic capital, there is always this border below the roll. The Corinthian is the youngest of these three Greek children and was very popular with the Romans. The Corinthian capital is the most elaborate of the three and may be compared to a basket grown over with acanthus leaves, which is what it was copied from. Each of the three orders has a certain kind of molding and roof decoration which best suits its particular style.

When, in the Age of Pericles, the Greeks were at their best, the Acropolis at Athens was crowned with buildings. The Parthenon, of which only this scarred ruin remains, was the most beautiful of them all. It is built in the Doric order, the earliest and simplest of the three styles of Greek architecture. The Erechtheum, which stands near the Parthenon, is Ionic. It is chiefly famous for its caryatid pillars—tall female figures that bear the weight of the porch roof on their heads. They represent the caryatids—priestesses who officiated in that temple.

Though the centuries have left us very little of the Parthenon, it is regarded as the most perfect in design and workmanship of any building man has constructed. It is simple and dignified without being massive; its lines are symmetrical and beautiful. It was 220 feet long and 100 feet wide, and housed a majestic gold and ivory statue of Athena Parthenos

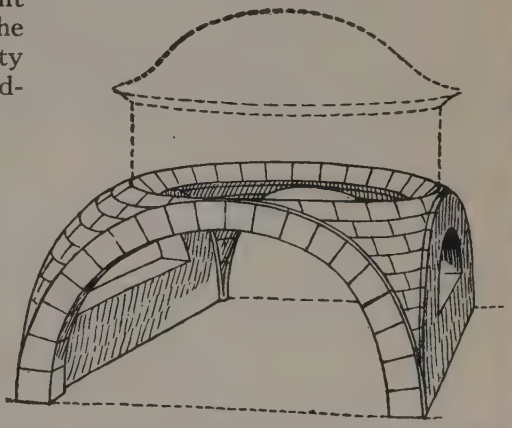
A Roman Temple

The Pantheon in Rome shows how the Romans used the Greek style in combination with ideas of their own. A porch with Corinthian columns and a pediment above them, as in the Parthenon, is added to the main part of the building which is a vast circular enclosure, supporting a dome. The building is lighted by a big window in the dome and its great wall is 20 feet thick. There are eight niches in this wall, holding statues of the chief Roman gods, for the Pantheon was a temple to all the gods, as its name tells you. (Pan is a Greek word for all, and theon is the plural of the Greek word meaning god.)

(Athena the Virgin). It was tinted with delicate, rich colors, very different from the gaudy hues of the Egyptians. Looking at the Parthenon, the seemingly simple, straight lines are restful; they give you the feeling of serenity and calm dignity that characterized Athena, the goddess of wisdom.

A Building of Gentle Curves

The lines of the Parthenon are not really straight, but are gentle curves. The pillars all slant slightly inward and swell gently just above the base. The gabled roof helps, too, to keep the building from having the flat look of the temple of Karnak and leaves that triangular space, the *pediment*, for sculpture. The floor rises a little in the center. So does the roof. Compare the Parthenon with the temple of Karnak and you will see what grace these curves add to the form of a building. No one



The diagram shows a dome supported on pendentives—rounded structures that would be full domes if they were extended. There are many of these in the greatest of all dome buildings, the Hagia Sophia at Constantinople.

The Romanesque Cathedral at Pisa

The facade or face of the cathedral at Pisa is a fine example of how the Romanesque style of architecture resembled the Roman, yet was not quite a copy of it. The Roman arch is there, repeated time and again, and the pillars which the Romans borrowed from the Greeks. The cathedral is built on the Roman basilica plan, too.

but a Greek, with the Greek's eye for beauty of form and delicate balancing of line, could have built the Parthenon.

But the carving is the crowning glory of this wonderful building. There is a frieze of figures around the interior, a broken border around the outside, and each pediment bears a sculptured story about Athena.

How the Romans Imitated the Greeks

The Romans, who followed the Greeks as chief actors on the world stage, were content merely to imitate and develop the Greek models. They were not artists and worshippers of beauty as were the Greeks. They built for utility and strength rather than for the expression of a beautiful

The Church of the Holy Wisdom at Constantinople

"The Byzantine architects added dome to arch, and arch to dome, until they produced a building whose majestic spaciousness is one of the wonders of the world." The domes of Hagia Sophia are flattened instead of being perfect hemispheres like the dome of the Pantheon. The architects of St. Sophia, which was built from 532 to 562 under Justinian, were Asiatic and probably got their ideas of dome building from the East, instead of from the Roman Pantheon. In 1453 Constantinople was taken by the Turks and St. Sophia became a Mohammedan mosque. The minarets were added then and many of the gorgeous mosaics were whitewashed because they deal with Christian subjects. The splendor of St. Sophia is in its rich interior decorations, which are Oriental in their brilliancy and intricate design.

thought, and they worked on a big scale, for big effects. Though the arch had been known and used by earlier peoples of the ancient world, the Romans were the first to become masters in its use. In the lintel roof the weight rests squarely on the upright supports. When a roof is arched the weight is distributed evenly among the stones composing the arch, and besides the downward pressure of the building's weight, there is a sidewise pressure called the *thrust* of the arch. With the introduction of the arch, the vaulted roof came into use, and later, the dome. The simplest form of the vaulted roof is known as the barrel vault because its shape resembles a barrel

The Magnificent Tomb of an Oriental King

The Taj Mahal was built at Agra, India, by the Mogul emperor, Jehan. It took 20,000 workmen 22 years to finish, and was designed as the resting place for Jehan's favorite wife and himself, but was used as a pleasure palace while they were living. The material is white marble and alabaster, and the whole Koran is written in mosaics of precious stones on the walls of the interior. The Taj Mahal, with its shining, fairy-like central dome, flanked by domed cupolas and minarets, is set in a beautiful grove of dark cypress trees, and has been called a "jewel of Paradise," so unearthly and magnificent does it appear.

sawed in two lengthwise. A diagram of it is shown on page 1952. When two of these barrel vaults are crossed, a groined vault is produced and in experimenting with this form of vaulting, the dome was developed.

Before the Romans came under Greek influence they had built the Cloaca Maxima, a vaulted sewer. They were very fond of domes and round buildings. Their greatest piece of architecture was the temple called the Pantheon. It has an enormous dome supported by a circular wall or *drum*. Do you see the Greek influence in the pillared portico? By architects this is regarded as rather out of place on a round building. Another Roman building which illustrates the Roman habit of doing things on a big scale is the Colosseum. You have read about the fierce gladiators who fought each other in the arena while all Rome looked on. The Colosseum was built to accommodate the vast crowds that came to these cruel combats. It is in the form of a circle and uses all three of the Greek orders as well as the arch. The Greeks never mixed different styles, but the Romans were careless about such things, and because their work was on such a big scale, the lack of uniformity was not a wholly bad feature.

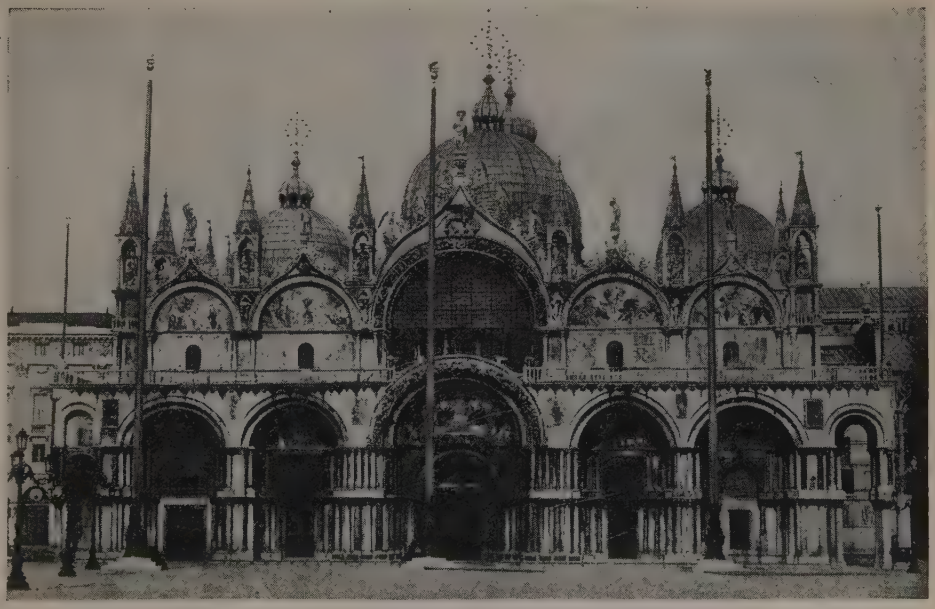
Origin of Byzantine Art

The vast territory governed by Rome became unwieldy for one man

to manage, so it was divided between two emperors and a second capital was set up at Byzantium. Then thousands of huge blond savages from the north came swooping down upon the western half, destroying everything in their path, and it was Byzantium, or Constantinople as Constantine named it, that guarded the knowledge and art of the ancient world against destruction, for a thousand years. So we must also visit the Turkish capital where we shall find the half Oriental and half European style of architecture known as Byzantine. The Byzantine architects were not content with the vaults and drum-supported domes of the Romans. Influenced by their Asiatic neighbors, they worked out a new style of their own. They added dome to arch, and arch to dome until they produced a building which, for spaciousness, grandeur and majesty, is one of the wonders of the world—the Hagia Sophia, Church of the Holy Wisdom. It was built by Justinian in Constantinople in 532 to 562. The central dome, 180 feet high, rests on four great arches that form a square, instead of on a circular drum as in the Pantheon. Piers (masses of masonry acting as supports) carry the arches. The aisles and galleries are formed by column-supported arches that lead the eye upward past a series of domes and semidomes to the glittering gold of the biggest one of all. The forty windows set round the base of the big dome light up the gorgeous marble and mosaic-lined walls with wonderful effect.

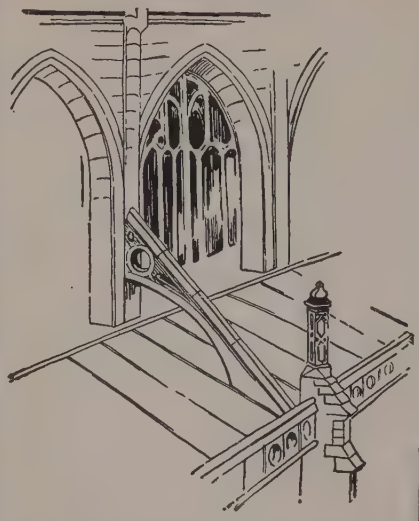
The Byzantine style, remember, is a dome style, so when you see a domed building you can think of the Byzantine builders of faraway

A Byzantine Church in Italy



Byzantium, or Constantinople, was a prosperous, brilliant city when most of western Europe was ravaged and desolated by the barbarian invasions and ceaseless civil wars. Her commerce made her the true capital of the world and her art was copied in both East and West. So it is not strange to find this Byzantine church in northern Italy. It is the Cathedral of St. Mark's in Venice, and except that there are no minarets, we might almost mistake it for one of the Mohammedan mosques, since the Mohammedans used the dome style more widely than the Christians.

A Flying Buttress



"Besides the straight pier buttresses, another kind, called the flying buttress, came into use." As you see, a flying buttress is a half-arch braced against the wall of the clear-story and carried on a pier of masonry.

Constantinople and their wonderful Hagia Sophia. In America we are especially fond of putting domes on our government buildings; and, it must be added, of mixing Greek pillars and Roman arches with the domes.

The Mohammedans and Their Art

The Mohammedans set out to conquer the world for Islam and in the attempt they learned many things from the people they conquered. They did not succeed in taking Constantinople until the fifteenth century, but long before that their round and bulb-shaped domes, flanked by towering minarets, had sprung up all over the eastern world. A minaret, you know, is a tower from which the Mohammedan priests call the people to prayer. You can usually find four of these minarets on a mosque, one at each corner. The plan of a mosque is simple. There must be a fountain of water in the center, because ablutions are a part of the Mohammedan ceremonial; a prayer hall with a niche pointing toward Mecca, and a tall, slender pulpit from which the Koran is read. The roofs of the early mosques were domed, vaulted or flat and the interiors were always covered with elaborate geometric designs in bright colors. The Mohammedan religion, in its hostility to idol worship, forbids the

Why Sainte-Chapelle Seems All Windows and No Walls

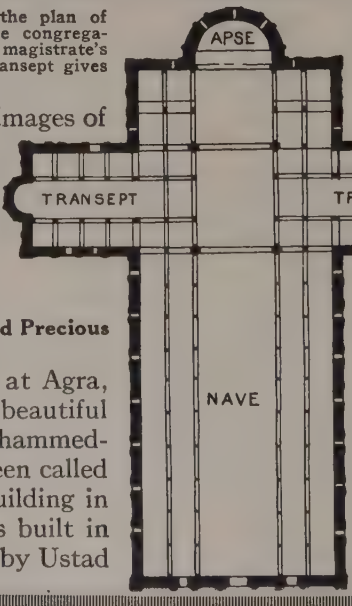
The Sainte-Chapelle at Paris was built in the thirteenth century to house a splinter said to have been a part of Christ's crown of thorns. It is attached to the Palais de Justice, which was at that time a royal residence. From the inside the building seems to have no walls at all, only beautiful traceried windows. Looking at the picture, you will soon see the reason for this effect—the buttresses make strong, thick walls unnecessary, for they are the real supports of the arched roof.

Orleans Cathedral

The cathedral at Orleans was begun in 1287, but three centuries later, when it was still unfinished, it was burned by the Huguenots, who, as persecuted Protestants, opposed everything undertaken by the Catholics. It was not finished until 1829, so, though Gothic in style, it was not built during the Gothic period and does not show the purest and best Gothic workmanship.

The Slender Spires of the Gothic Style

Milan Cathedral in northern Italy was built largely by German architects, so it is not a truly Italian building. The cathedral itself, the third largest in the world, will house 40,000 people and shows the typical Gothic style in its myriads of slender spires and statue-ornaments. There are 4,440 carved figures on the exterior alone. In the eighteenth century, though begun 500 years before, the cathedral was not finished, and a Renaissance facade was added. As this was out of keeping with the rest of the building, its removal was begun in 1900 and a true Gothic front built.



The diagram shows the plan of a cathedral. The nave is the long central space where the congregation gathers. The apse contains the altar instead of the magistrate's seat as in the Roman basilicas. And, as you see, the transept gives the church the very appropriate form of a cross.

making of graven images of persons or things, so the Mohammedan artist must confine himself to designed decorations.

A Poem in Marble and Precious Stones

The Taj Mahal at Agra, India, is the most beautiful building in the Mohammedan style and has been called the most poetic building in the world. It was built in 1652 and designed by Ustad Isa, a Mohammedan architect. The Taj is surrounded by a landscape garden whose dark green trees and glistening pools make the very best kind of setting for its glowing white marble. Like the Parthenon, its balance and harmony of line are its chief charm, though the inlaid decorations of precious stones are wonderful in their delicate beauty. In the Taj, as in other Moham-

medan buildings in Persia, Syria, Egypt and Spain, they changed the flat dome of the Byzantines to a pointed, bulb-shaped structure.

Origin of Christian Architecture

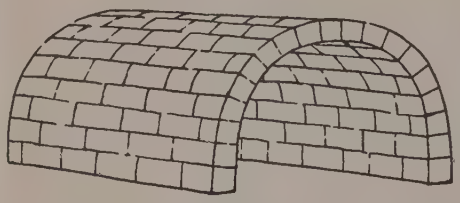
While the fiery, fanatical Mohammedan faith was spreading over the eastern world and threatening to swallow up the slowly waking civilization of the West, the Christian monks were working to bring about peace and brotherly love among the warlike barbarians. There was so much trouble and bloodshed and strife for

The English Gothic

Westminster Abbey, where for centuries the kings of England have been crowned and her great men laid to rest, is typical of the English Gothic style. Compare it with the pictures of French and Italian churches and you will see how it differs. Westminster's walls have straight and solid lines. It was in England that the perpendicular Gothic was used most, and Westminster is built in that style. The French gained their effect of mystery and lightness by hundreds of high, slender towers and rich, minute decorations. Westminster has a sober, serene look, because it is longer and lower than the French cathedrals, and its towers are rather squat and blocky. The greatest charm of this building is in the beautiful perpendicular traceries and moldings, and in the fan vaultings of the interior.

a long time after the fall of Rome that there was neither time nor money for beautiful buildings. The earliest Christians had worshipped secretly in catacombs underneath Rome and in

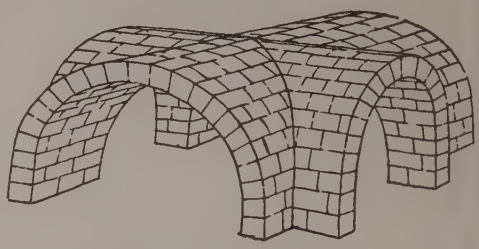
Barrel Vault



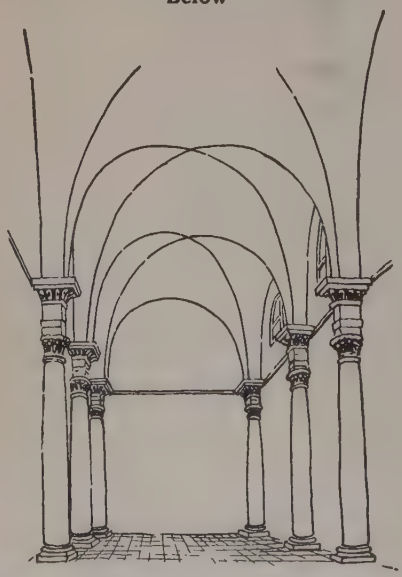
private houses. But in 325, Constantine made Christianity the legal religion of the Roman Empire and the Christians could worship openly in churches of their own. The basilica was the type of public building most used by the Romans. Like the diagram of a cathedral on page 1950, it had a long central space called a *nave*, a rounded-out end or *apse* where the magistrate sat, and aisles along the sides of the nave. The roof was usually flat, supported by columns and arches, while the apse was vaulted. It was quite natural that when the Christians began to build churches they should take for their pattern the plan that was most familiar to them, so we find the first Christian churches nothing but basilicas with an altar in the apse. A little later they added the *transept*, that crosswise aisle in front of the altar. What does the shape of the building remind you of? Yes, a cross.

But the Goths and Franks who had overthrown the Romans had ideas of their own, so we find the basilica churches changing a little as time goes on. The architecture that developed was called Romanesque and was a blending of the old, known forms. There were round arches and columns combined to make tier upon tier of arcades as in the cathedral and leaning tower at Pisa. And other churches, like St. Mark's in Venice, show the influence of Constantinople in their domes and semidomes. Then towers began to appear among the domes, standing alone with the town bell in their tops or as a part of the Romanesque castle, church, or monastery. Can you think of anything in the life and habits of the times that taught the Romanesque architects to build them? You remember in those fierce, lawless days every baron had his castle stronghold defended and watched over by staunch towers of heavy masonry. Some of these castles, especially those built by the Germans, are truly beautiful pieces

Groined Vault

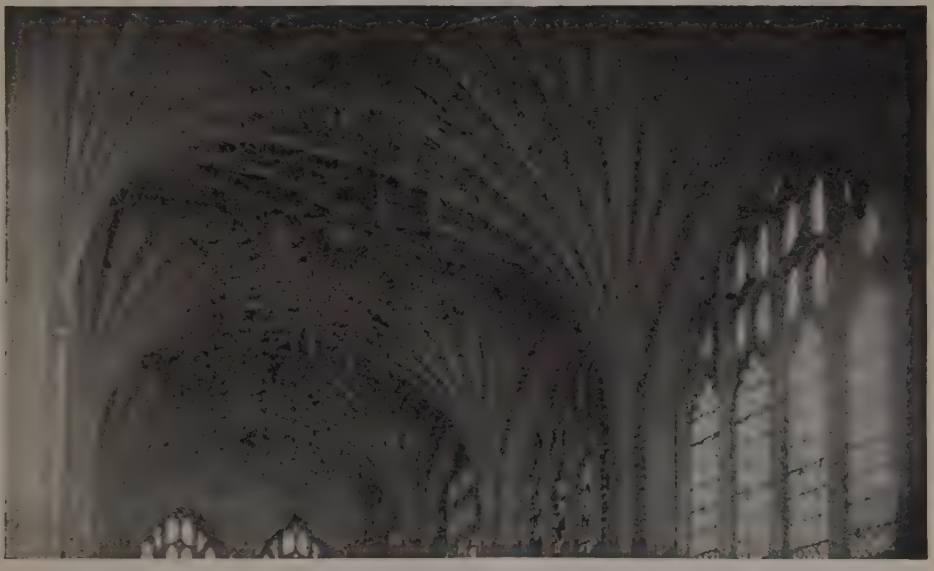


How a Groined Vault Looks from Below



Gothic Vaulted Ceilings

Above you see a fine example of ribbed vaulting. Instead of making the vault a solid structure as in the barrel or groined vault, there is a skeleton support of ribs. Besides being easier to



manage than the uniformly curved vaulting, ribbed vaulting offers a splendid chance for decoration. It makes a beautiful ceiling. The fan vaulting of Westminster Abbey, shown in the lower picture, is a further development of ribbed vaulting. The ribs are built to extend outward in all directions, an even distance apart, from the supporting pillar.

of work. And from the custom of building towers for defense came the use of towers for other purposes.

The Architecture of the Middle Ages

But the Romanesque was only a stepping-stone to the Gothic architecture that was the crowning glory of the Middle Ages. The Greeks built a flat roof, supported by pillars; the Romans used the arch which grew into the dome in the East. It remained for the western builders to take up the work where the others had left off and, in trying to find a way of making fireproof ceilings, to produce the lofty, vaulted stone roofs and slender spires of the Gothic cathedrals, the builders went back to the groined vaults of the Romans. The thrust of a barrel vault is evenly distributed—it pushes uniformly outward. With the groined vaults of the Gothic style, the weights and strains of the building, instead of being distributed evenly along the curved surface of the vaulting, are concentrated at a few points from which the arches spring; and these points of strain are strengthened by piers and buttresses, leaving room for great stained-glass windows with their marvelous traceries. The buttresses were continued up into a myriad of towers and spires to give them strength and weight. The columns, instead of standing solidly and majestically alone as in the Greek buildings, were made more slender and were grouped. The arched doorways, the facades of the buildings and the roof-cornices were ornamented with intricate patterns of carving, leering gargoyles and beautiful moldings. A gargoyle is a figure used to discharge the water from a roof corner. Many of these gargoyles were made to represent grinning devils, dragons and evil spirits.

In comparing Notre Dame with the Parthenon you feel the contrast between the simplicity of the Greek and the intricacy of design of the Gothic temple. A Gothic cathedral has a different beauty from that of a Greek temple. It is rich, as old lace with a delicate pattern of fine, interwoven threads is rich. It is mysterious, that is, you cannot see at once everything to be seen in it; it leads you back again and again. And each time you look, the wonder and beauty and majesty of it grows.

These Gothic cathedrals are the true voice of the higher aspirations of the Middle Ages. The cathedrals were begun at a time when warring nobles were more often at peace, and rich townsmen began to build beautiful churches and fine homes; a time when trade and industry were developing. The energy and idealism of the Teuton tribes were being organized and guided by Roman ideas of law and empire, and above all, the Christian church was inspiring the souls of men with the pure white flame of faith and self-sacrifice. The monks had striven and taught and suffered martyrdom until the barbarian warriors developed ideals of chivalry in the midst of their harsh feudal system, threw themselves against the Mohammedan Turks who held Jerusalem, in wave after wave of desperate attack; and their architects and their workmen expressed this fervent devotion in stone and marble and colored glass in the cathedrals of Notre Dame, Rouen, Amiens and Cologne.

When the Workmen Were Artists

In the dark ages after the fall of Rome, no one but the monks could build in peace. But now the laymen had time to learn the mason's and stonecutter's art and to organize into

The Cathedral of Notre Dame in Paris

There are many Notre Dames, but the Notre Dame of Paris is the greatest of them all—by some people it is thought to be the most beautiful of Gothic churches. The perpendicular lines of its facade, cut by the horizontal row of figures in their niches and by the slender-pillared gallery above, give it a simple dignity quite different from the effect produced by the intricate ornamentation of some of the other Gothic cathedrals. The row of figures above the doorways represent twenty-eight kings of Israel. One of the most beautiful features of Notre Dame is the great rose window in the end of the transept, of which you can catch a glimpse at the right of the picture.

guilds. Guilds were the medieval trade-unions, that protected the workmen against oppression and made sure that the goods produced were up to standard. Most of the great cathedrals were designed on a larger scale than could be worked out, and the original plans were often changed many times during the hundreds of years the cathedral was in the course of construction. The master builder often left the working out of details to the fancy of the workmen, who were artists in their own lines. The result was square-capped towers where spires had been intended; a great mass of carvings and sculptures, different in pattern; wings, windows

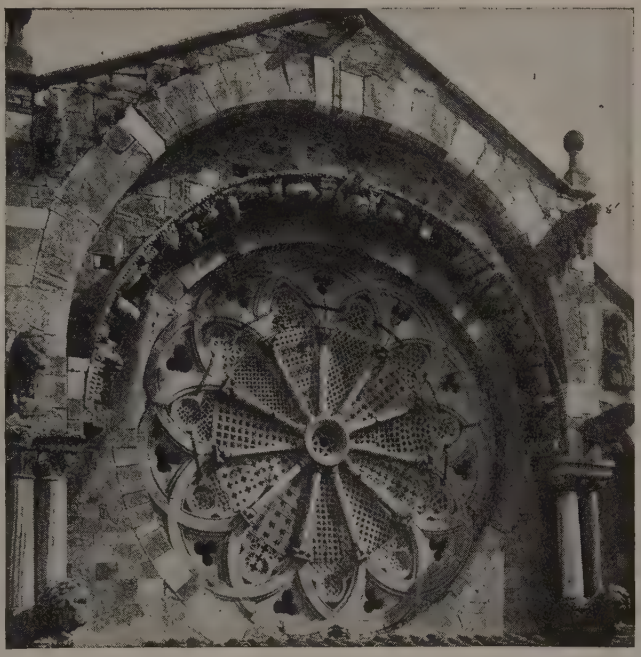
A Cathedral in the Late Gothic Style

Three centuries were required to build Rouen Cathedral. Parts of it are early Gothic and very good, but the facade, shown here, is in what is called the Flamboyant style, when the fancy of the Gothic builders ran to intricate designs of stone fretwork, a profusion of pinnacles and ornaments. Compare it with Notre Dame Cathedral and see which one you think the more beautiful.

and chapels begun on a large scale and finished hastily in a totally different manner. Such things are characteristic of the Gothic buildings.

The use of groined and ribbed vaulting concentrated the strains of the building at a few points so that the roof was really supported on legs — the piers and buttresses—and the spaces between were filled by stained glass windows, which from the interior gave the building the appearance of having almost no walls at all. And it made possible the use of lighter and more delicate columns

A Traceried Rose Window

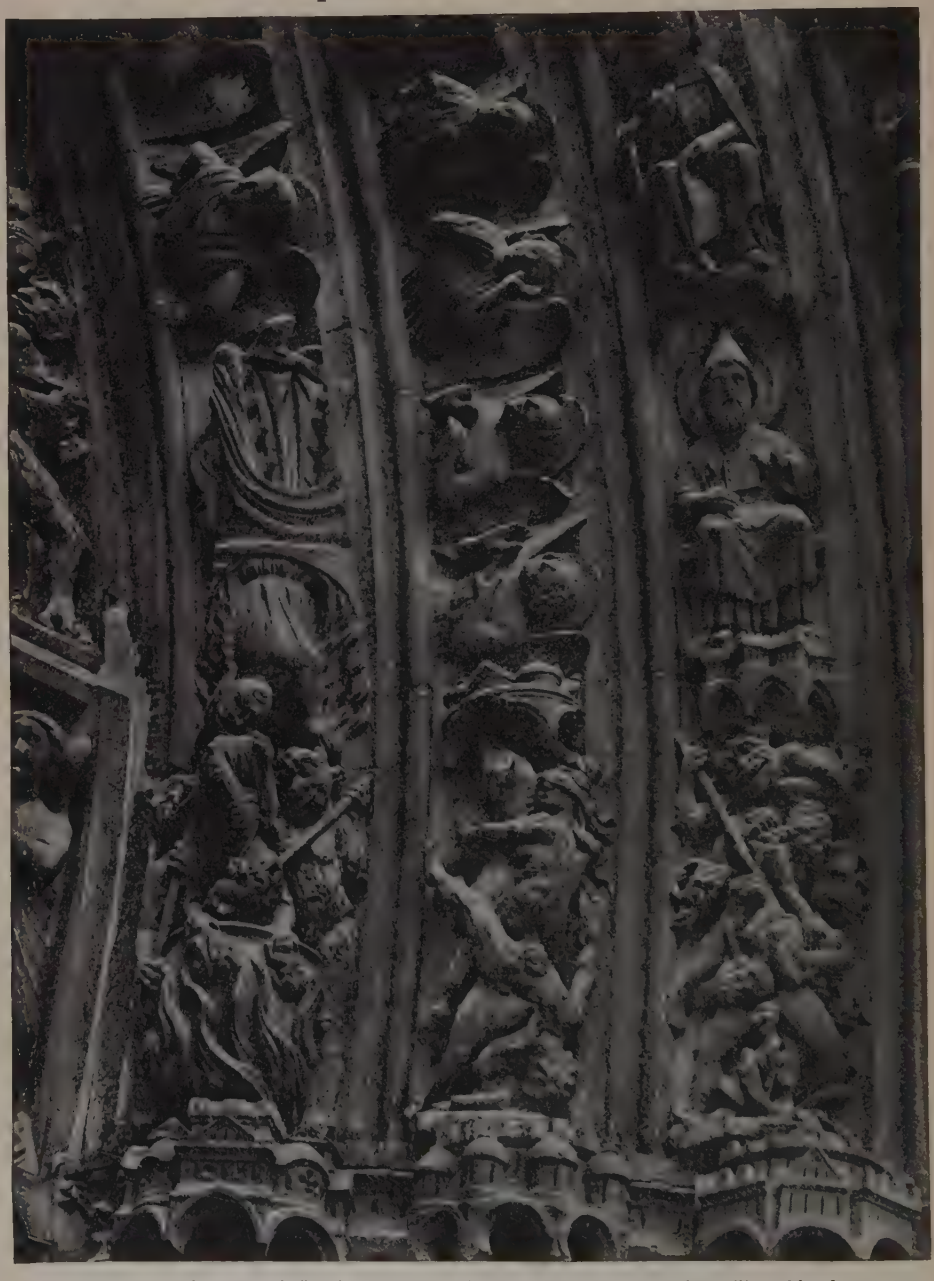


One of the Banished Devils

in the interior where the weights of the roof did not fall. Besides the straight pier-buttresses, another kind, called the flying buttress, came into use. The master builders of the twelfth and thirteenth centuries built flying buttresses on the outside to meet the thrust of groined vaults within, and also to take away the heavy look that a plain-buttressed wall sometimes has. The picture shows you what a flying buttress is—a sort of half arch from the main wall of the clear-story to the pier support, pushing sidewise as all arches do, only its push is inward *against* the push of the vault arches forming the ceiling of the cathedral.

Gargoyles, like this one, are to be found on most Gothic churches. They are placed at the corners where the eaves poured their water to the ground. The name gargoyle comes from the "gurgle" made by the water as it runs down. Some of the gargoyles are animals and many, like this one, are devils or evil spirits supposedly driven out of the church by the power of good within.

The Spirits Over the Doorway



The elaborate richness of Gothic cathedrals is due in part to carvings like this, from one of the doorways of Notre Dame. It shows you what the early and best Gothic decorations are like. Rows of carvings like this are used to face the wide space left exposed when the heavy walls were cut through. Angels, cherubim, saints, devils and tortured souls are mixed up, helter-skelter and upside down. The elaborateness of these carvings are partly responsible, too, for the long periods of time required to finish some of the great cathedrals.

When Ornament Was Overdone

The earliest buildings in the Gothic style had very pointed arches, but as the style grew older the arches got rounder and lower, until, in the fifteenth century, the beautiful slender lines of the early Gothic almost disappeared. The same thing happened to the capitals and mouldings. At first they were simple and in good taste, showing the pretty dog-tooth design and prim arrangements of leaves. In the fourteenth century, or middle Gothic period, the carvings were more numerous and not so conventional, but always well placed. By the fifteenth century the foliage on the capitals ran riot like an unpruned vine, and arms and crests and mottoes were used for decoration instead of designs from nature. There was a similar change in the appearance of the windows. With the early, very pointed arches, two simple windows were often combined under one arch. Later, various forms of tracery—that is, the stone framework supporting the glass—were used until, in some of the elaborate rose or round windows of the fifteenth century, the glass was only used to pick out the pattern of the stone which supported it. Another form, the perpendicular, which divided the window into geometric figures, became popular, especially in England. In fact, the whole tendency of the later Gothic was toward straight lines.

A Gothic Carved Figure

When the Mind of Europe Was Reborn

But in the sixteenth century, while the Gothic was becoming too flamboyant and losing most of its former graceful charm, a new movement was developing in Italy. The Middle Ages, as we have seen, were a time of fierce warfare and bitter struggle, in spite of the higher ideals of the Church. But now men began to believe in individual freedom. The fall of Constantinople in 1456 drove many Greek scholars with their precious store of ancient knowledge, to Italy; the vast trade and good seamanship of the Italians led them to explore unknown lands, thereby proving many of the old theories about the earth to be false; the guild system made common people rich and powerful and taught them to rebel against unjust rule. The invention of printing made books so common and cheap that it was much easier for the average man to learn how to read. And with this knowledge the churches and monasteries lost much of their influence over the minds of the people, because it was the monks who had been the only educated men, the teachers of the rest of the world. It was a period of profound intellectual awakening. This great change came about first in Italy and from there spread over the rest of Europe. The surge of new ideas, the awakening of sleeping forces was called the *Renaissance*, which means "New Birth."

The Spread of New Ideas

The awaking started when men began to realize and study the beautiful things the Greeks and Romans had made and said. In

An Italian Villa of the Fifteenth Century

How different from the Gothic cathedrals! Strozzi Palace, in Florence, was built in the early days of the Renaissance style. It is refined and very simple, and, though it has something of an air of gloom about it, it is in exquisite good taste. Notice how the architects have forsaken the pointed arches of the Gothic builders and gone back to the round arch and straight lines of the classic Roman.

architecture a mixture of the old Roman forms—the pillars, round arches, domes and pediments—with the already existing styles, began to be used. In this way a new style called the Renaissance style, was produced. It developed first in Italy, then in France, and later in Germany, England and Spain. Men had thought it a sin to build anything beautiful or adorn it richly unless it was to be put to a religious use. Now noblemen and even rich merchants built beautiful homes, there were fine public buildings and pleasure palaces. The Louvre, the great art museum in Paris, was built at this time. But probably the greatest work of the period was still done on the churches—of which St. Peter's in Rome and St. Paul's in London are examples.

At first the Renaissance buildings had simple, fine facades and lovely courtyards inside. In England gable roofs and dormer windows were very popular. The later, seventeenth and eighteenth century Renaissance, became too close a copy of the classic originals, not suited to the time nor the purpose for which it was used. Most of the decorations were too heavy or else there was too much of them. All three orders were used at once, and many buildings were built with colossal columns reaching to the third story, too massive for the roof they were used to support.

In England the Renaissance style goes by different names—"Eliza-

The Largest Church in the World

St. Peter's, in Rome, is the largest church in existence and was begun at the order of Pope Nicholas V. Part of it is the work of one of the greatest artists of all time, Michelangelo. Most of it was built during the sixteenth century, at the height of the Renaissance period. Its single, massive Greek columns and vast central dome show the harking back to Roman ideas. That great dome is 140 feet in diameter and rises 405 feet from the ground. In fact, everything in St. Peter's is built on so huge a scale and is so perfectly proportioned that you do not realize its vast size at once. It is just the reverse with the Gothic churches, you know—the mass of fine details and the dividing up into many parts make the whole look larger than it really is.

bethan" for the early type introduced under Queen Elizabeth, and "Jacobean" for the later period. St. Paul's, the great London cathedral, was built about this time. Can you tell how it shows the Roman influence? See how its dome differs from that of Hagia Sophia. It is built up on a high drum like that of the Pantheon and, like many Romanesque buildings, is capped with a short spire called a lantern.

Contrast Between Greek and Gothic Ornament

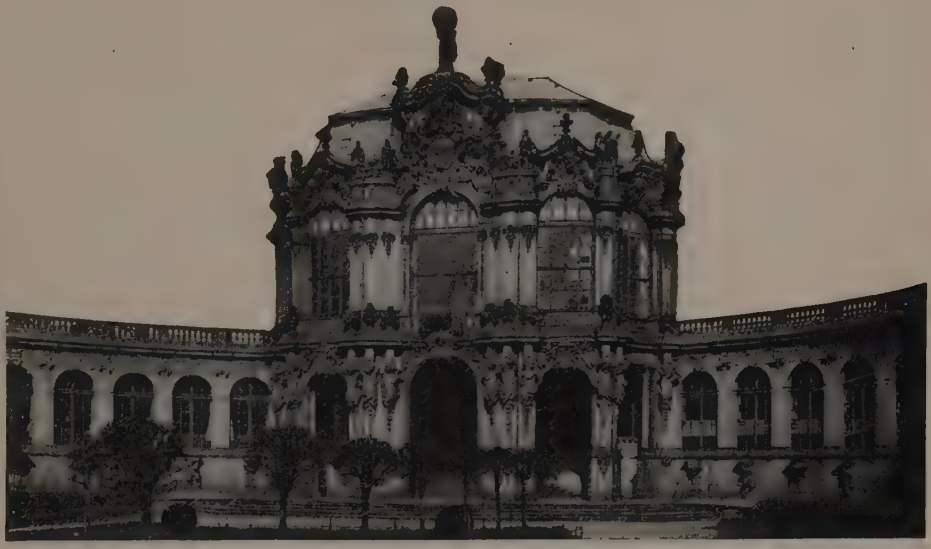
The Greeks built simple structures with a few beautiful sculptures for ornament. The architects of the Gothic style covered their churches with carvings, but these carvings fitted in with and helped work out the general scheme of the whole. The later Renaissance builders lost their sense of proportion and fitness. In the Rococo style that developed in the eighteenth century, there were scrolls, shells, fruit and cupids, all jumbled together in the most unseemly fashion. Many of our amusement park pavilions are copies of this style. Then there was a second classic revival in which the builders went back to Greece instead of to Rome, for their models. The first Renaissance columns had been largely Corinthian. Now the severe Doric was brought to life and made to do duty without the beautiful sculptures to relieve it, and the result was an architecture that was, for the most part, bare and cold. And yet many truly beautiful buildings were produced during this period.

This brings us down to modern times and our sight-seeing trip through a modern city. You will find all these types and styles we have been looking at right here in our own country. What styles can you find

Another Renaissance Church

St. Paul's, in London, is another church in the Renaissance style. It was built by Sir Christopher Wren about a century later than St. Peter's. The dome is smaller and is flanked on the west front, which we see here, by two lofty bell turrets. The peristyle—the row of columns surrounding the drum—is one of the best features of the building. Do you like domes lantern-capped, as in St. Peter's and St. Paul's, or flat, as the Romans built them?

This is What "Rococo" Means



Here is another example of overdone ornament. It is Zwinger Palace in Dresden, built in the Rococo style. Just as the Gothic developed into the too elaborate flamboyant style, the simple, severe Renaissance, that gave us the Strozzi Palace shown on page 1960, degenerated into fantastic forms like this—"fussy" buildings ornamented with masses of cupids and garlands and scrolls.

A Beautiful Modern Doorway

St. Bartholomew's in New York City is a fine modern church in the classic style. This doorway is considered very beautiful in its truly Greek simplicity—severe, straight lines enriched by exquisite sculptures.

The Cathedral of St. John the Divine

St. John's the Divine in New York City is not a copy of any one known style. It strives to express our American idea of what a church should be in our own way. And it ranks with the noblest and best of Europe's works of architecture. As you see, the general effect is Gothic, but the round arches and rounded projections are Romanesque. It is an enormous structure, 100,000 square feet in area, and its central spire is more massive than any tower of Gothic construction. Because New York's population is made up of so many different peoples, the worshippers in St. John's speak many tongues. To provide for them all, seven circular chapels have been built around the east end—you are looking at the west front here. They are called the Chapels of the Tongues, and services are held in them in seven different languages. St. John's was built under the guidance of Ralph Adams Cram, who believes fervently in the development of a new, American style of architecture.

in the public library in your town? Our capitol at Washington is in the Renaissance style, with its drum-supported dome and rows of single columns. You can find Gothic elements in most churches in America, where there are no time-honored traditions, because the Gothic style so well expresses the religious sentiments. Here in America, in response to business needs we have invented the skyscraper. You have read about the skyscraper in the story of the Builders. It is the only truly new style we have. A few American architects are working to produce an original American style, not only in churches like that of St. John the Divine in New York, but in cosy little homes on our western plains, and in great, towering skyscrapers like the Singer building in New York. But we cannot produce anything great and beautiful in architecture or anything else, unless we have fine, noble thoughts in our hearts to express, for it is the builder's soul that makes architecture.

The Seven Wonders of the World

IN the ancient world there were seven works of man that excited the wonder of the world. Four were buildings, two statues, one a beautiful terraced park. They were the pyramids of Egypt, the temple of Diana at Ephesus, the pharos, or lighthouse, at Alexandria, the mausoleum, or temple tomb of King Mausolus of Caria in the Holy Lands, the statue of Jupiter at Olympia, by Phidias, and the Colossus of Rhodes. The seventh wonder was the hanging gardens of Queen Semiramis of Babylon. We can more than match some of those wonders, but our idea of what is wonderful has changed. The things that astonish us most are scientific discoveries and inventions. The telephone and wireless telegraph, the steam locomotive, and electric light and power are things to be proud of. The discovery of radium, the invention of the spectroscope, and the use of ether to make people undergoing surgical operations insensible to pain are other wonders. Some would include the discovery of germs, as the causes of certain contagious diseases, and leading to their prevention and cure as one of the modern wonders. That makes eight. Can you think of any more?

Wonders, Ancient and Modern

Now doesn't it seem rather strange when you come to think of it, that there should have been exactly seven wonders, as if just that number had been laid out in the first place? Yet, you see, that couldn't be. For one thing, when the Egyptians built the pyramids —the only one of these seven ancient wonders, by the way, that we have left—the Greeks didn't exist and so the Egyptians couldn't have foreseen there would be six more big things built for the world to wonder at.

The reason of the limitation was that from the early history of mankind seven was, by many nations — among others, the Greeks—regarded as a mystic number. So the Greeks were the first to think of cataloging the world's wonders in an exclusive list of seven. The list was made by a certain Antipater of Sidon about a hundred years before the birth of Christ. Then the Romans adopted it, and from them it passed on down through the learning of the Middle Ages to the present day.

Why Just Seven Wonders?

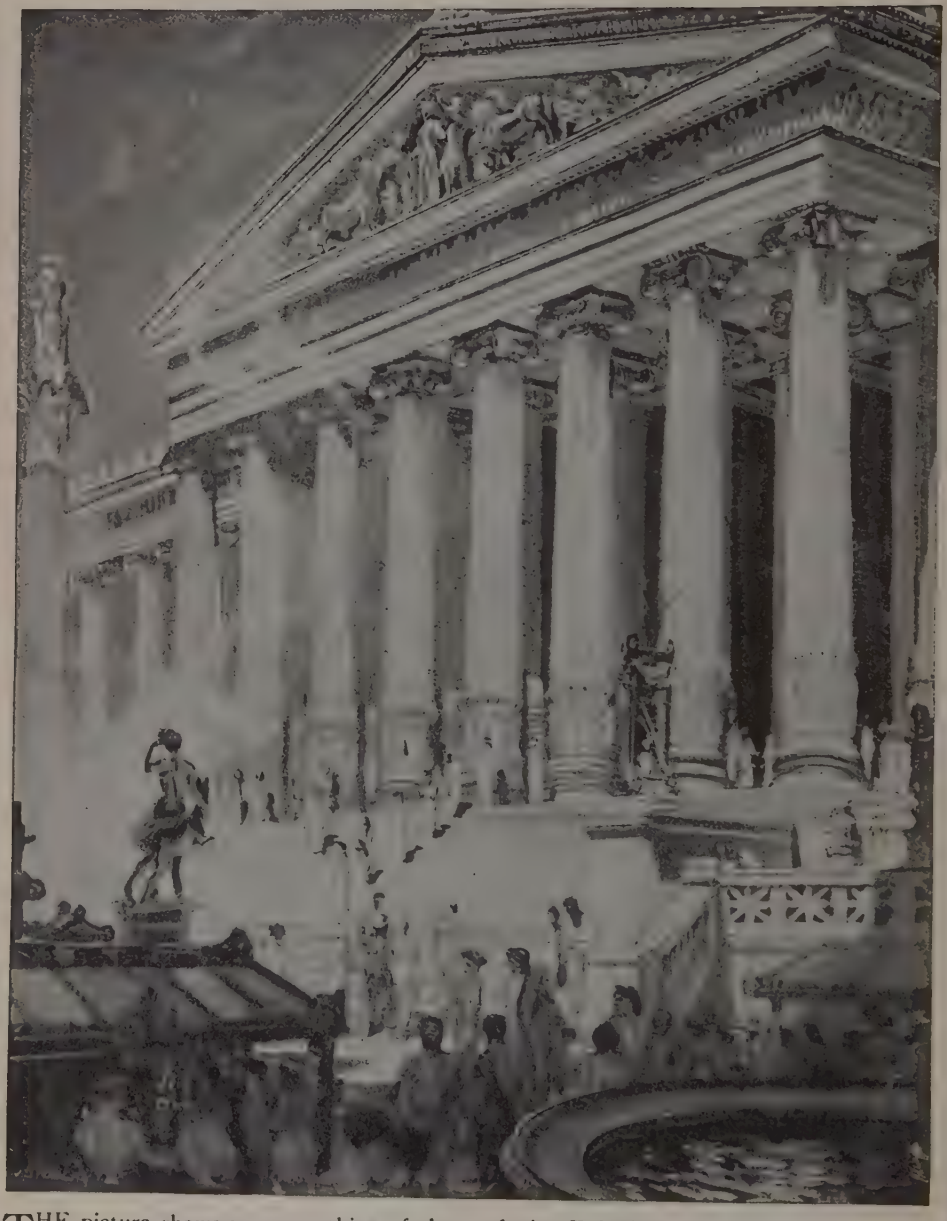
The Pyramid

THE pyramids were tombs built by Egyptian kings for themselves, because of their belief that as long as a man's mummified body was preserved, his spirit would continue to live, but that if it was destroyed his spirit would die. These pyramids are enormous masses of maso that required great engineering skill to bu For many years it was not known what th object was, for the rooms which contained mummies were hidden and sealed. Later the roo

nd the Sphinx

and mummies were discovered by accident. One of them bore this inscription, "Osiris, King of the North and South, Men-Kau-ra, Living Forever, Thou Shalt Never More Have Enemies, O King of the North and South, Men-Kau-ra, Living Forever." The Sphinx is thought to have been an open-air temple. It is built in the form of a lion with a man's head, and the shrine was between the huge paws. The people are walking toward it in the picture.

The Temple of Diana at Ephesus



THE picture shows you something of the magnificence and beauty of the Temple of Diana at Ephesus, the second wonder of the world. It was one of the most beautiful things produced by the artistic Greeks whose ideals of beauty are still the ideals of the world. Diana, the virgin goddess of the moon and the chase, was the patron goddess of the Ephesians, and her shrine in the beautiful temple was visited by thousands of worshippers who left all sorts of valuable gifts, some of which have been found in the ruins. A small statue of the goddess with her favorite animal, the deer, stood facing the temple. You can see it at the left of the picture.

The Pharos of Alexandria

THE pharos, or lighthouse, of Alexandria, on an island at the mouth of the Nile, was built by one of the later Egyptian kings. It was a massive tower of white marble surrounded by a spiral staircase. A fire was kept burning continually at the top, which guided vessels by its smoke during the day and by its light at night. The lighthouse and the land upon which it rested have both been weathered away by the waves and wind so that this ancient lighthouse lives only as a memory.

The Colossus of Rhodes

THE Colossus of Rhodes was a bronze statue of the sun-god, Helios, a hundred feet high. It stood at the entrance to the harbor of Rhodes in Asia Minor, as you see, with one arm outstretched to welcome navigators. At first it was believed that the statue stood astride the harbor but this has been proved incorrect. Though overthrown by an earthquake in 200 B.C., it was considered so wonderful that the fragments were left where they fell for almost six hundred years.

The Great Statue of Jupiter at Olympia

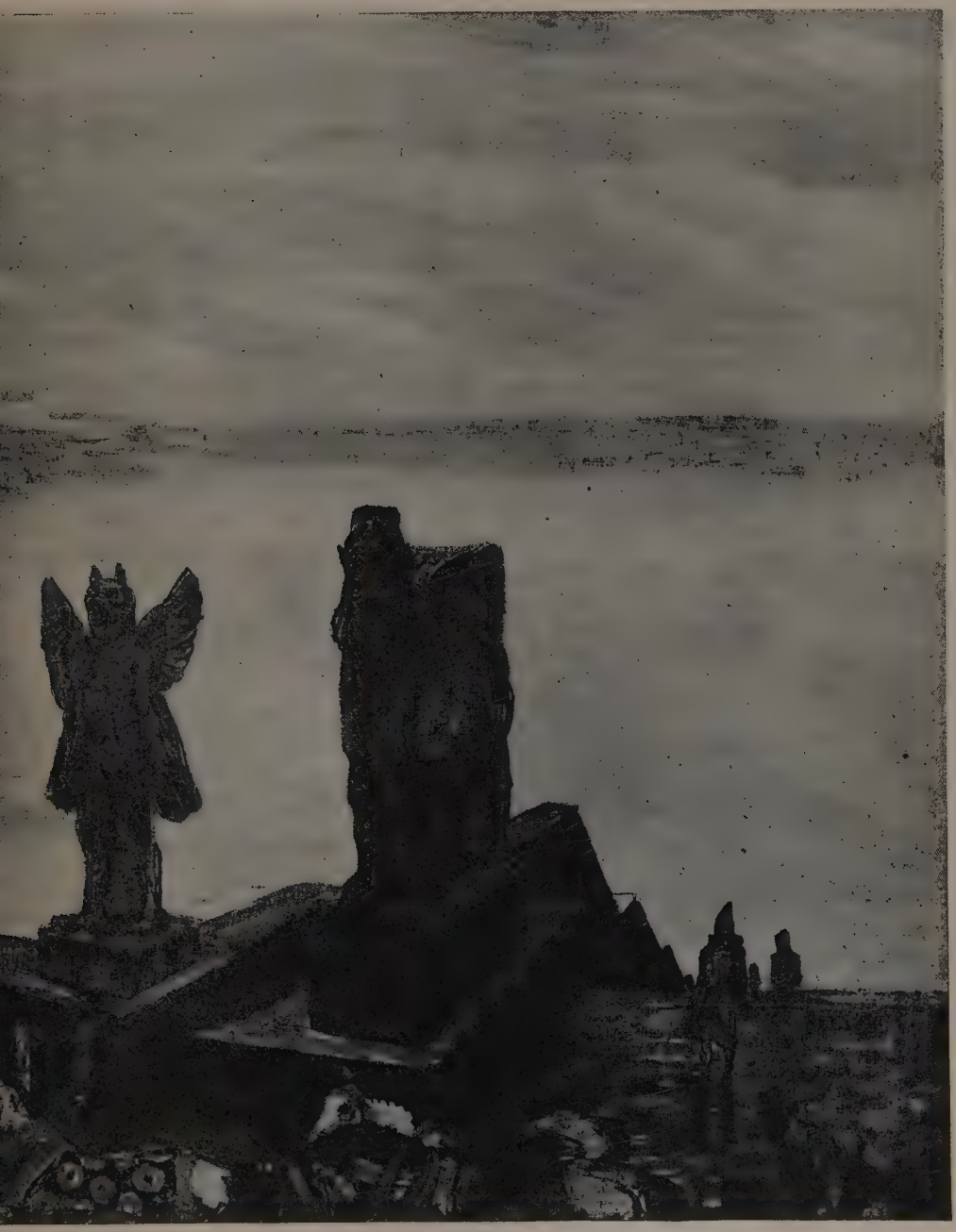
THIS seated figure of Jupiter in the temple of Jupiter at Olympia, in Greece, was the work of one of the greatest of Greek sculptors, Phidias. The throne was of ivory, the mantle of gold, and the whole figure flashed with precious stones.

Like all the seven wonders, this statue of Jupiter was a huge affair—for people were impressed with bigness just as they are today—but it had beauty to recommend it also. The face of the chief among the gods and ruler of the world expresses serenity, power, and majesty, as if he were indeed every inch a king.

The Hanging Garde

THE city of Babylon was built on a dry and treeless plain. A certain king of Babylon married a princess from Media, a mountainous country to the east. She pined for a sight of her hills, so her husband built for her this te garden rising from the waters of the Eup

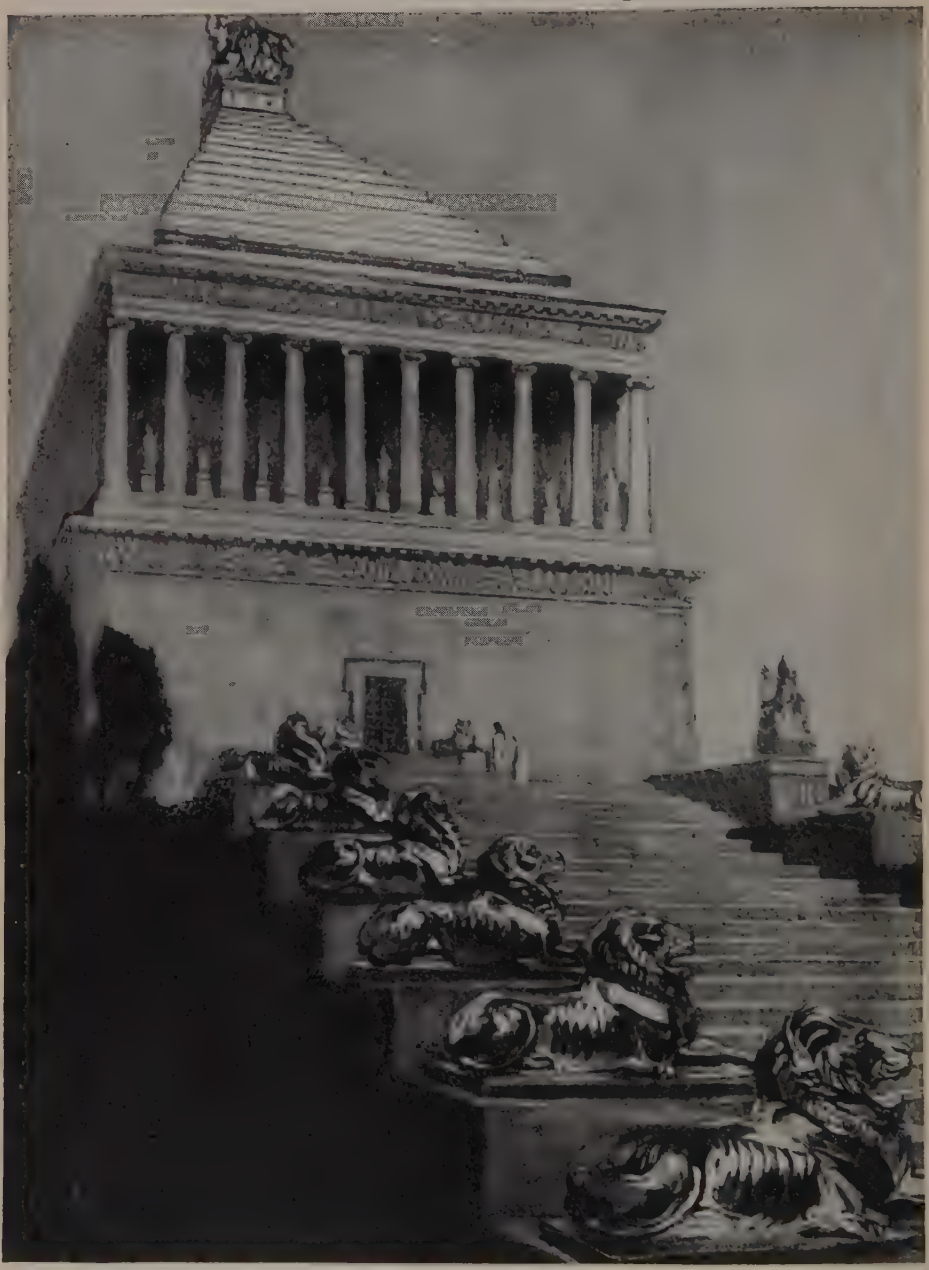
f Babylon



vas called a "hanging" garden, though the
s and flowers were really planted on a succes-
of stone terraces.

You will be surprised to learn that some remnant of these famous gardens remains to this day in the shape of a heap of ruins.

The Tomb of Mausolus, King of Caria



THE temple tomb of Mausolus built by his queen, Artemesia, was so famous that its name, *mausoleum*, got into everyday speech. By *mausoleum* we now mean any beautiful tomb or monument to the dead. The lion-guarded stairway leading up to the building was one of its most striking features.

King Mausolus and his wife were rulers of the Kingdom of Caria in Asia Minor, and Halicarnassus, where the tomb was located, was the capital and chief city.

A Song of the Camp

"Give us a song!" the soldiers cried,
The outer trenches guarding,
When the heated guns of the camp allied
Grew weary of bombarding.

The dark Redan, in silent scoff,
Lay grim and threatening under;
And the tawny mound of the Malakoff
No longer belched its thunder.

There was a pause. A guardsman said:
"We storm the forts to-morrow;
Sing while we may, another day
Will bring enough of sorrow."

They lay along the battery's side,
Below the smoking cannon;
Brave hearts from Severn and from Clyde,
And from the banks of Shannon.

They sang of love, and not of fame;
Forgot was Britain's glory;
Each heart recalled a different name,
But all sang "Annie Laurie."

Voice after voice caught up the song,
Until its tender passion,
Rose like an anthem, rich and strong—
Their battle-eve confession.

Dear girl, her name he dared not speak,
But, as the song grew louder,
Something upon the soldier's cheek
Washed off the stains of powder.

Beyond the darkening ocean burned
The bloody sunset's embers,
While the Crimean valleys learned
How English love remembers.

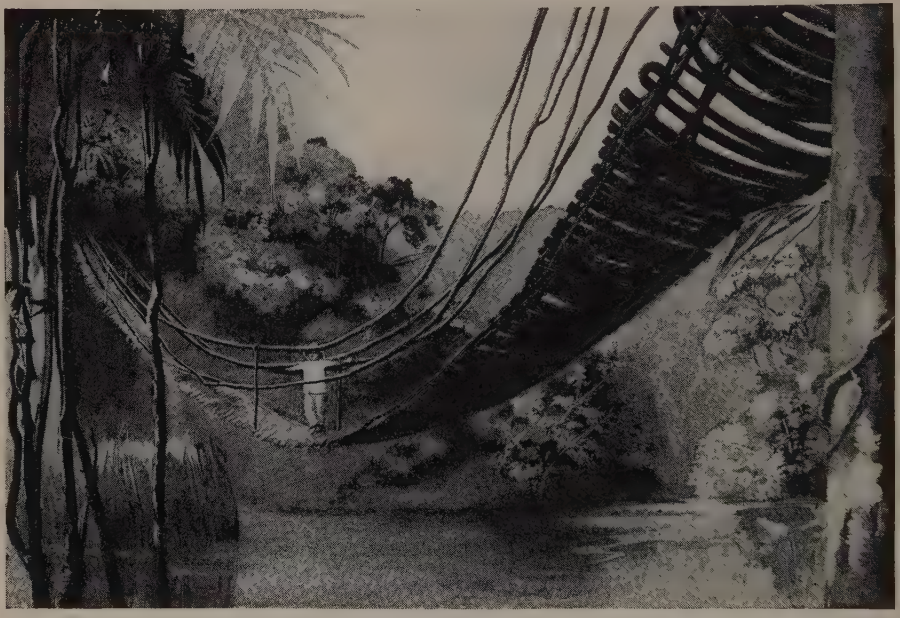
And once again a fire of hell
Rained on the Russian quarters,
With scream of shot and burst of shell,
And bellowing of the mortars!

And Irish Nora's eyes are dim
For a singer dumb and gory;
And English Mary mourns for him
Who sang of "Annie Laurie."

Sleep, soldiers! still in honoured rest
Your truth and valor wearing;
The bravest are the tenderest, —
The loving are the daring.

BAYARD TAYLOR

Bridges and Bridge Building

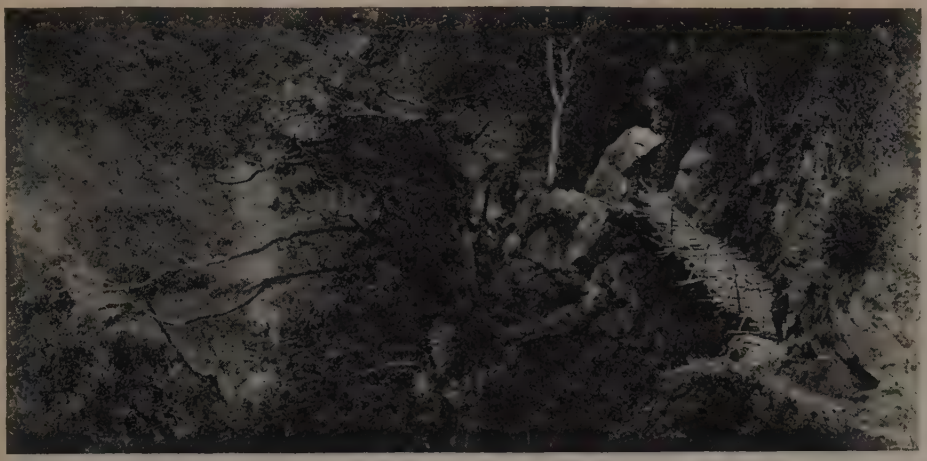


Bridges That "Grow Wild"

YOU might almost think that bridges grew wild, to look at this one. It's a native bridge across a stream in the Philippine Islands; native, in two senses. The most important part of it is, the vines of the wild grape are found climbing up the trees in the woods of those Islands and the natives by carrying them across a stream and laying a platform with staves, make crude bridges similar in principle to those suspension bridges which were among the most notable triumphs of modern engineering.

In other words, you will see from the series of pictures which follow, that the great bridges of the world which represent the highest form of engineering skill are often merely primitive bridges on a large scale. The bridge across the Thames will remind you of a favorite game of childhood because it is called "London Bridge," (although there are other bridges) as its counterpart in the little old bridge of wood and stone is known as the "Iwakuni Bridge" in Japan. The combination girder and arch bridge across Victoria Falls on the Zambezi River in South Africa, was started by throwing a cable across the stream as the Philippine bridge builders throw a vine across a stream to start such a bridge as that we see in the illustration. But, in bridge engineering, while it is comparatively easy to do a thing on a small scale, it becomes extremely difficult, and taxes the best trained brains when a similar thing is attempted on a large scale. In the case of the Zambezi bridge, for example, which crosses a vast gorge 200 feet deep, they first shot across a cord attached to a rocket. With the cord they hauled across a wire; then with the wire drew over a small cable. Then, running on this small cable, a truck with trolleys carried a still larger cable which held the two half arches together until they were firmly joined and riveted into the one arch that now spans the gorge.

Another Piece of Philippine Engineering



THIS is another example of native engineering in the Philippines. It shows a crude span bridge to connect a narrow pathway along the side of a mountain.

A Bridge That Floats on Boats

THIS is a famous bridge over the Oka River at Nizhni Novgorod, Russia, and employs a principle which has been used by armies in crossing streams from time immemorial—the support of the bridge platform on boats. In India there are a number of such bridges over its great rivers. It is said that Alexander the Great crossed the Oxus with rafts made of the hide tents of the soldiers, filled with straw.

The Great Tower Bridge of the Thames

YOU will often see lift bridges that open up like the blades of a jackknife, but the famous Tower Bridge in London is unique in having that permanent footway at the top.

When the leaves of the bridge are down, foot travelers as well as vehicles use that passage way, but when the leaves are raised to let a boat through, foot passengers are carried to the upper roadway by what the English call "lifts" and what we call "elevators." The great towers are not built entirely of stone as they seem to be, but are of steel, and the stone is simply the outer covering. The architecture is in the Gothic style. About 10,000 vehicles cross this bridge in a day and over 25,000 foot passengers.

The bridge gets its name from the two great towers, but it is also interesting to note that it crosses the Thames near the Tower of London. See that distant tower.

The Famous Brooklyn Suspension Bridge

HERE you see how a great American engineer, John A. Roebling, worked out the same problem which the Filipinos solved with the grape vines. Instead of using grape vines, he used steel cables of immense strength attached at either end to towers built for the purpose. You notice the roadway is suspended from the cables, as is the roadway that connects the two banks in our first picture. In the crude vine bridge you even see the vertical supports connecting the suspending vines with the platform, but while the roadway of the vine bridge bends down, the roadway of the Brooklyn bridge is almost straight, curving just a little upward. The Brooklyn bridge has roadways for street cars as you see, as well as for foot passengers and vehicles. The cars of the elevated railroad also cross it. Half the time as you cross the Brooklyn bridge, you see men up among those web-like cables painting them. This is necessary to prevent the cables from rusting, as they are especially liable to do in the salty air from the ocean.

If you start at the New York end and walk to Brooklyn over this bridge, do you know how far you will have gone? Over a mile. Yet the length of the part of the bridge that crosses the water is only 1600 feet. The rest of the bridge length is devoted to the approaches which, as you can see from the picture, end at the towers.

Like a Bridge in Fairyland

THIS, as you can easily see, is a bridge in Japan. It is in one of the parks in Tokyo and consists of a single arch. Doesn't it look like a scene in fairyland?

London Bridge and Its Arches

THIS is the famous London Bridge. You see it is put together as if the builder had taken a number of those little humped-backed bridges of Japan, set them in a row resting on piers across a stream, and then built a straight roadway above them. The first London bridge was built in the twelfth century and it had wooden houses and shops all the way across it. Do you see why? There were many people crossing all the time and the shrewd old English shopkeepers wanted to get the business. They lived upstairs in the houses and the shops were down below.

The Eads Bridge at St. Louis

THIS is the Eads bridge in St. Louis. When it was built in 1874 it was the talk of the engineering world, because it overcame difficulties that had never been successfully dealt with before. As the current is very swift here, when the river is high, it was necessary that the foundation should be very strong. So Captain Eads built his piers on rock by sinking caissons, or great hollow chambers, in which the men could work in laying the foundation. When you tip up a tumbler in a bowl of water you notice that the air prevents the water from coming up into it. The caisson works on somewhat the same principle, the water being forced out of it by compressed air which is driven into the caisson by machinery. Inside the caisson are tubes reaching from the top to the working chamber at the bottom. In one of these tubes is a ladder by which the men go down. Another tube brings down needed material and takes up broken rock made by the digging. A third tube brings down air for the men to breathe.

The arches in the Eads bridge are made of great steel tubes. There is a double track for railroad trains—in the picture you can see one of these trains crossing the bridge—and above this are the passageways for vehicles and foot passengers.

A Bridge Like a Bookshelf

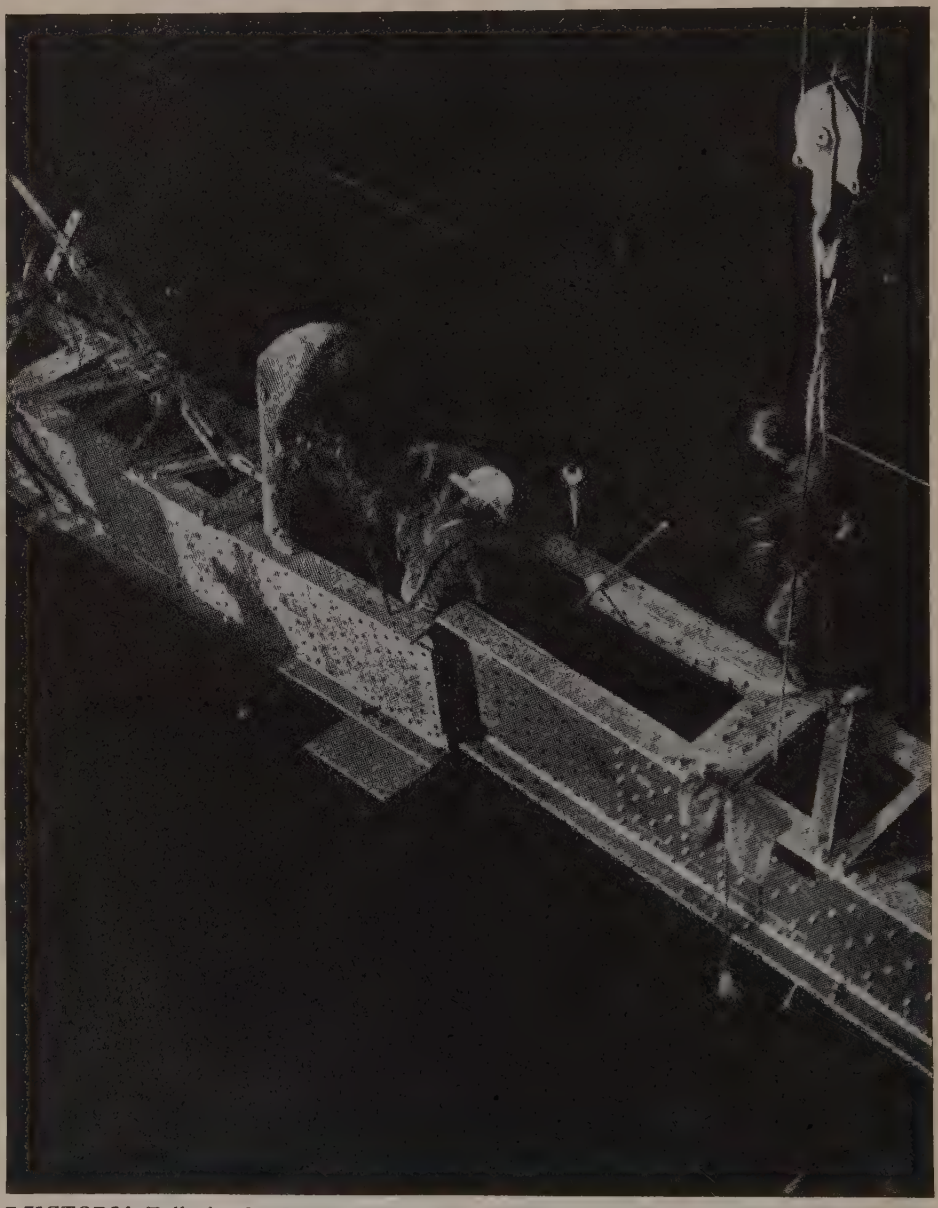
YOU know when you want a single row of books in a place where there is no room for a bookcase—just above the desk in a bedroom, for example—a very convenient shelf can be put up by screwing up brackets on the wall. A cantilever bridge is built on a similar principle. This picture shows the cantilever bridge over the river Forth in Scotland. The Forth bridge was designed by two English engineers. In the middle of the river is an island, and on each side of this island the water is so deep and swift it is impossible to sink piers. Accordingly, one pier was built on the island and two others near the shore. On these the cantilevers stand. Their great arms reach out over 1300 feet, leaving a space between them of 350 feet, which, as you can see, is connected by another little bridge. The arches are very high. This is to enable vessels to pass under the bridge, which they do, even at high tide. After the English engineers had proven that this principle was practicable, it was applied to a number of other situations where it was necessary to cross wide spaces with few piers.

The difficult task of bridging the river Forth at the point where the structure we have been describing now stands, was begun by Sir Thomas Bouch who built a famous bridge over the Tay, another Scotch river. But one wild winter night a storm destroyed part of the Tay bridge and carried a train loaded with passengers into the river. Then Sir Thomas died of a broken heart and the present bridge was built by other engineers.

To Catch Falling Men and Tools

THE irregular shaped object, seemingly suspended in mid-air, is a net device to catch men or tools that might fall from the farthest points of the left side of the bridge, on which the men are working. The distance is so great (the gorge is much wider than the impression of it given by this picture) that the supporting girders cannot be seen.

To Make Travel Safe for Others



VICTORIA Falls in the Zambezi River in Rhodesia, South Africa, is the greatest cataract in the world. A railroad bridge across it was completed in 1906, carrying out Cecil Rhodes' dream of a railroad uniting Cairo with Cape Town. The picture shows workmen, part of whom are English and part native, working 350 feet above the roaring waters of the gorge. They are constantly wet with spray from the cataract. The parts of this bridge were made in England and shipped to Africa, but so careful are the calculations in modern engineering that the parts fitted each other and the distance they had to span within the half an inch left for adjustment.

The Cantilever Bridge at Quebec

HERE we are looking out across the St. Lawrence River during the building of the cantilever bridge at Quebec. These are the two shore spans to which the center span has been linked.

The uniting of the central link with the cantilevers is a very difficult engineering feat and this bridge twice met with disaster; once when a cantilever fell during a storm and once when a connecting span turned over and fell into the river.

Of these bridges it may be said as is said of the states of our Union, "united they stand"; but, before, they are liable to fall.

How Some Boys Buil

HERE are two boys who have become interested in the great and useful art of bridge building and they have just about completed a little cantilever bridge across a creek. This bridge is only 4 feet wide and the uprights or cantilevers, 7 feet high. The boys made the uprights or posts 4 inches thick and 8 inches wide. The braces are 2 inches thick and 8 inches wide. The boys braced the bridge with wires which they twisted in cables and anchored to the trees. Any of our boy readers who wish to follow their example should see that the cables are anchored securely, as this is very important.

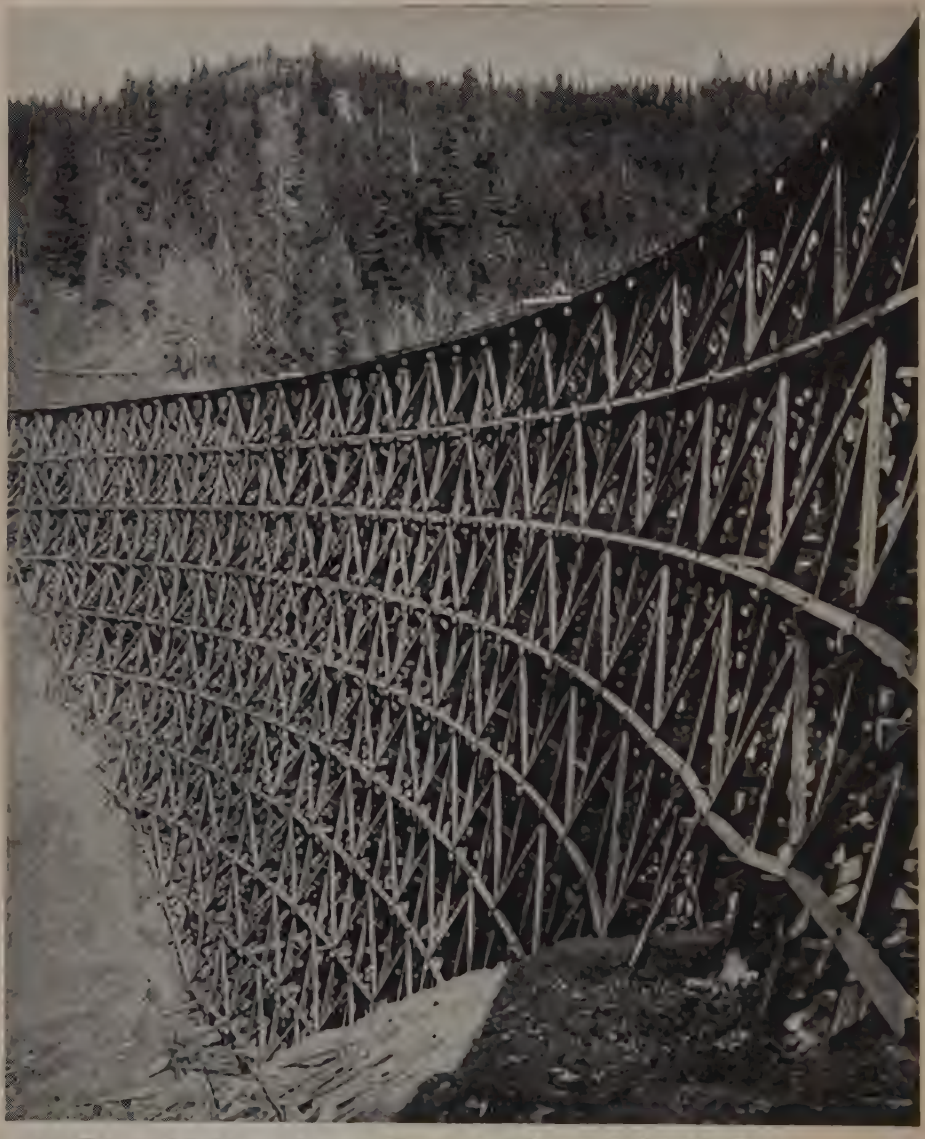
Now imagine a weight placed on this bridge

a Cantilever Bridge

Notice that the weight is in the center. It is held by the cable which passes over the top of the post and to the tree. The heavier the weight the more the cable will pull, the harder the cantilever will push down on the foundation and the stronger the bridge becomes.

The boys made this for a foot bridge, but if they had made it a little longer it could have been used for wagons. With what he has learned at Manual Training, any ambitious boy should be able to make a bridge just as good as this one, and it would be a good idea to put a railing from one cantilever to the other so there will be no danger of anyone falling off.

A Bridge on a Wooden Web



WHAT does this bridge remind you of? It looks to me, for all the world, like a spiderweb, it is so full of "criscrosses." And Mrs. Spider is a wonderful bridge builder, although she never has occasion to build railroad bridges. This picture shows a bridge across a dry ravine on the Canadian and Western Railroad in Canada. It is built entirely of wood—with the exception of the bolts, of course, that hold the wooden supports together. Such bridges are built in timbered countries where the material is cheap. The greatest objection to them is that they are liable to catch fire.

"IN THE PAGES OF GOOD BOOKS
LIES THE MAGIC TO INSPIRE OUR
DREAMS AND THE POWER TO MAKE
THOSE DREAMS COME TRUE"